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THE WORLD
AND ITS WORKERS

THE WORLD AND ITS WORKERS

(ELEMENTARY COMMERCIAL GEOGRAPHY)

BY

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PREFACE

THIS book is intended for pupils of about 13 to 15 years of age in Central Schools and Classes, Continuation Schools, and Secondary Schools in which the Teaching of Geography has an economic bias.

Such readers, having presumably completed the course prescribed in the Board of Education's *Suggestions for the Teaching of Geography*, are well qualified for the slightly specialized course set forth in this survey of the field of human activities. The purpose of the book is not exclusively utilitarian; with a view to tracing the story of human progress, special attention has been paid to great enterprises of past and modern times.

The exercises are numerous and varied in character, and in most of the groups there is one in the form of a suggestion for further reading. The books suggested are so low in price that a small geographical library might be formed in every school; a list will be found at the end of the book.

Statistics have been used rather sparingly, but it is assumed, in the exercises, that readers will have access to the *Accounts relating to Trade and Navigation of the United Kingdom*; the December issue for

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any year gives annual statistics for that and the two preceding years.

That due regard has been paid to the fact that the Geography of the British Isles is dealt with in the last year of the School course mentioned above, will be evident on turning to the last six chapters of this book. Further details relating to British industries may be obtained from Book 6, the New World Geographies, to which this book may be regarded as a sequel.

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1. PROGRESS !

MAN entered into possession of his heritage, the Earth, perhaps two hundred thousand years ago. That period, vast indeed when measured by the span of human life, is insignificant when compared with the age of the Earth, for millions of years must have elapsed since its foundations were laid.

During those millions of years the foundations were settling down ; continents were rising and sinking, and mountains were being uplifted. Rivers were ceaselessly engaged in carving valleys in the highlands, building up plains in the lowlands, and laying down under the sea thick beds of sediment that were eventually to form new land. Sun and rain were exercising their power to clothe the land with vegetation, whilst countless generations of animals lived their life and passed away, many species actually becoming extinct.

Such are the facts recorded by the Earth itself. No human eye beheld the changes that took place during the earlier stage of its history, and even prehistoric man left little record of what he saw. But the story has been unfolded by study of the sedimentary rocks, which contain, in the form of fossils, a record of the plants and animals that existed upon the Earth in bygone ages.

Man, the latest arrival amongst living creatures, is distinguished from all others by power to improve his lot. He started at the level of the beasts with which he

had to struggle for existence ; but the history of man upon the Earth is an almost unbroken record of progress. Each generation receives as a legacy the knowledge accumulated by earlier generations of men—knowledge of the Earth and its resources, and of how to use those resources for the benefit of mankind ; and each generation contributes its quota to the general fund of knowledge.

Prehistoric man did not fail to add his share to the general fund ; the rocks bear testimony to the long long struggle he made to escape from the bonds of savagery. He passed through the Palaeolithic or Old Stone Age—a period during which Britain must have been connected with the Continent—knowing nothing of agriculture or animal-rearing, and probably unable to articulate a single word ; but he had learned how to make flint weapons. During the Neolithic or New Stone Age he was armed with improved implements ; he had learned something about cultivation and pastoral work ; he was able to make fire ; he manufactured pottery and built huts.

The discoveries of the Neolithic Age led to the use of the softer metals, which distinguishes what is called the Bronze Age. During this period man made a great step forward in civilization. This is indicated by the variety of articles made for use in the home and for personal adornment.

Relics of the Stone and Bronze Ages have been yielded by many countries. They have been found in cairns, barrows, caves, beds of rivers and lakes, peat mosses, and many other places. It must not be supposed, however, that all people in the world

were living in the same age at one time; the Stone Age, for example, has lasted in savage districts up to modern times.

The Bronze Age gradually yielded to the Iron Age, which leads up to historic times, that is, to the times of which we have records in writing. It is not known in which country, or at what period, the Iron Age began; but it extends to and includes the present day, though the twentieth century may perhaps be more correctly described as the Age of Steel.

Historic times may be divided into several great periods, each of which is marked by an advance in navigation. The earliest civilized peoples of whom we have definite records were the Assyrians, Babylonians, and Egyptians. They dwelt beside great rivers, the Tigris, Euphrates, and Nile, and though they carried on much trade overland by means of camels, the river was their great highway. From the point of view of commerce we may call the period in which they flourished the "age of river navigation".

A second period is marked by "navigation of the narrow seas"; it indicates a big step forward in commerce and in civilization, the two going "hand in hand". This period saw the shifting of the world's great trading centres towards the west, and the rise of such peoples as the Phoenicians, Greeks, Venetians, and others who lived on the shores of the Mediterranean Sea.

Following this came the "Age of Ocean Navigation", with the discovery of a "new world", and the shifting of the centre of gravity of the commercial world still farther westward—to the Atlantic

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sea-board. Another group of trading peoples arose, first the Portuguese and Spaniards, then the Dutch, French, British, Germans, and Americans.

Ocean navigation has been marvellously developed during the last hundred years, as we shall see later. The introduction of steam as motive power for ocean-going vessels might well be regarded as marking a distinct age, so greatly has it revolutionized ocean travel. Then it has been shown that it is possible to navigate vessels below the surface, though it is doubtful if submarines will ever be of much value in times of peace.

The last great stage upon which man has entered is "navigation of the air". The enormous value of aeroplanes and airships for the purpose of reconnaissance in warfare, and for delivering attacks behind an enemy's lines, gave a great impetus to both aviation and the building of aircraft during the European War, 1914-18.

During the period immediately following the war, the Atlantic was crossed by aeroplane and by airship; an aeroplane travelled half-way round the world—from England to Australia—with pauses at selected stations *en route*; air-transport services for passengers, letters, and merchandise were established between Britain and the Continent, between important centres in Europe, and between the opposite coasts of North America.

But the nineteenth century saw the opening of a period in which human progress cannot adequately be measured by developments in navigation alone. Man has solved such problems as the weighing of the Earth and the Sun; he has invented machines to do

work that formerly required a thousand men, and high-speed steel that will retain its cutting edge at white-hot temperature; he has harnessed water-power, solar heat, and electricity, and even drawn microbes into his service to purify sewage, to improve his crops, and to combat disease; he has discovered the powers of electro-magnetic waves, X-rays and radio-active minerals, and so entered a New World as full of wonder as was America to sixteenth-century Europeans.

Recent developments (only one of which we will notice here) have astonished even twentieth-century people. In July 1920, news sent by wireless telephone from Poldhu was published in *The North Atlantic Times* issued twice daily on the steamship *Victorian*, which was on a voyage to Canada. A conversation was carried on between people at Chelmsford and passengers on the *Victorian*, when the vessel was over 2,000 miles away.

EXERCISES

1. Read *The Story of Primitive Man*, *The Dawn of History*, and *Outline of Industrial History* (chaps. i-iii).

2. THE AGE OF DISCOVERY

WE who live in the most enlightened age, possessed of all the knowledge accumulated in past times, and aided by scientific discoveries in our own days, may well marvel at the achievements of men of other ages. With the end of the fifteenth century the period commonly called the Middle Ages came to

a close. The next three centuries, sixteenth to eighteenth, are marked by the discoveries of such scientists as Copernicus, Kepler, Galileo, and Newton.

They established that the Earth is not flat but spherical; that it performs a revolution upon its axis daily, and a journey round the sun each year; and that these movements cause day and night and the succession of the seasons. They discovered also that the mysterious force called "gravitation", which makes water flow downhill, is the force that causes the atmosphere to cling to the Earth, that brings about the rise and fall of ocean waters which we describe as tides, and that controls the planets in their journey round the sun.

These achievements were matched by discoveries upon the surface of the Earth itself.

Think of Columbus who sailed for three thousand miles over an unknown ocean in a caravel ninety feet long; of Magellan and Drake who ventured in small vessels across both Atlantic and Pacific; and of Vasco da Gama who sailed round the southern end of Africa and found a sea-route to India. These men possessed remarkable courage, and their exploits mark a distinct advance in earth-knowledge; they affected the history of the world. "All men," wrote Sebastian Cabot, "affirmed it to be a thing more divine than human to sail by the West into the East."

It was at first believed that Columbus really had reached the Far East; but it was soon shown by Amerigo Vespucci and others that he had discovered a "New World"; though North America was in fact visited in the tenth century by Norsemen who had settled in Greenland.

Magellan and Drake were the first seamen who "sailed by the West into the East", Magellan in 1521 and Drake in 1578. They passed from the Atlantic to the Pacific by the strait which still bears Magellan's name.

Columbus and da Gama were followed by many other navigators, only one or two of whom can be mentioned now. John Cabot sailed along the coast of North America, and brought home news of wonderful fishing-grounds beyond the western ocean. Before the end of the sixteenth century, fishing-boats from England, France, Spain, and Portugal, to the number of over 300, were making regular trips to the Newfoundland Banks.

It was during the sixteenth century, too, that the Dutch explored the north-west coast of Australia, which was believed to be part of a great continent that lay around the South Pole. In 1642, however, the Dutch seaman Tasman discovered that Australia was an island; and a century later Captain Cook proved that New Zealand also consisted of islands.

We can state the results of the labours of the great navigators referred to above in very few words; they gave to the world an exact knowledge of the distribution of land and water on the globe. The work unwittingly started by Columbus in 1492 was practically completed by Cook before the end of the eighteenth century; and that period of 300 years is certainly the most noteworthy in the history of geographical discovery.

During those three centuries the ships of European sea-faring nations sailed every ocean; they skirted the coasts of every continent and the edge of the

Antarctic ice barrier; they passed through Torres Strait, Cook Strait, Behring Strait, Magellan Strait—through every channel that separates great land areas—each of which bears the name of the bold seaman who first traversed it.

The same period naturally witnessed great progress in the science of navigation. Until the eighteenth century the mariner's equipment consisted of compass, log, and astrolabe. The last of these was used to take the sun's altitude, a reading required for the calculation of latitude; it has been superseded by the more accurate sextant, invented by Hadley in 1731.

The log was used to determine the speed of the ship at different times. Knowing this the navigator could give a fair estimate of the number of miles sailed per day, and so find, roughly, his longitude. Great efforts were made during the sixteenth and seventeenth centuries to find a better method of determining longitude. Newton pointed out that the chief difficulty was to construct a clock that would keep accurate time during a sea voyage. The British Government then offered a prize of £10,000 for an instrument that would enable position at sea to be determined within 60 miles, or £20,000 if the margin could be reduced to 30 miles.

The prize was won by John Harrison, who invented the famous grid-iron pendulum, and afterwards applied the principle of compensation to a balance wheel. He completed his instrument in 1735, and strangely enough had to wait forty years for the payment of the prize-money.

But there is more to set down to that glorious age

of discovery. The seekers after a sea-road to the East were the discoverers of the belts of calms and constant winds which prevail over the oceans. During the famous voyage across the Atlantic in 1492 the sailors were terrified to find that the wind blew steadily from the north-east; they thought they would never be able to return. The Portuguese seamen who first sailed south of the Equator were equally terrified by winds blowing steadily from the south-east.

Thus the early navigators discovered the "constant" winds now called the North-east Trades and the South-east Trades, and also the belt of equatorial calms called the Doldrums, that lies between them. Their other discoveries include the calms of Cancer and the calms of Capricorn, and also the regions of westerly winds—one north of the calms of Cancer and the other south of the calms of Capricorn.

With such a record for the sixteenth and following centuries, we may safely say the Middle Ages came to an end with the fifteenth century. The horizon of Europeans was extended, and extended in more senses than one; they had new lands, new products, and new peoples to think about; old ideas and superstitions were swept away, and knowledge of the laws which govern the world took their place. The discovery of new lands led to an Age of Colonization, during which new nations of white people were established in the Americas, Australia, and New Zealand.

One point must be made clear before we go any further. So far as we know each of the other continents has been inhabited for quite as long a period

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as Europe—it is indeed believed that Europe was peopled by migrations from Asia. Thus when we speak of the “discovery” of America we are taking the standpoint of Europeans; that continent was known to its own inhabitants ages before the white man dreamt of its existence. The same may be said, of course, of Australia, New Zealand, and the remote parts of Asia and Africa. But Europeans took upon themselves the task of exploring the world, and each fresh region they reached was naturally hailed as a discovery.

Whilst the navigators of the sixteenth, seventeenth, and eighteenth centuries succeeded in building up exact knowledge of the distribution of land and water areas upon the globe, and made some acquaintance with the most important products of the lands they discovered, the exploration of the continents in detail became the special task of nineteenth-century people. The task is not yet wholly completed, for there are large tracts of land in South America, Asia, Africa, and Australia, of which the most that can be said is that they are imperfectly known.

Two great achievements in the realm of geographical discovery belong to the twentieth century, for none of the many expeditions sent to explore the Arctic regions during the seventeenth, eighteenth, and nineteenth centuries succeeded in penetrating as far as the North Pole. This point was first reached by the American explorer Peary in 1909. Corresponding success crowned the efforts of two exploring parties in the Antarctic at almost the same time, though, unhappily, the leaders of one of the expeditions never returned. The South Pole was reached

by Amundsen on the 16th December 1911, and by Captain Scott on the 17th January 1912.

The return journey of Scott and four companions was attended by a succession of misfortunes. Finally the explorers were caught by a furious blizzard which rendered further progress impossible. The blizzard is known to have lasted nine days, but before the end of that period the gallant band had perished.

EXERCISES

1. Read *Master Mariners, The Story of Geographical Discovery, Captain Cook's Voyages, and Polar Exploration.*

3. THE WORLD'S WEALTH

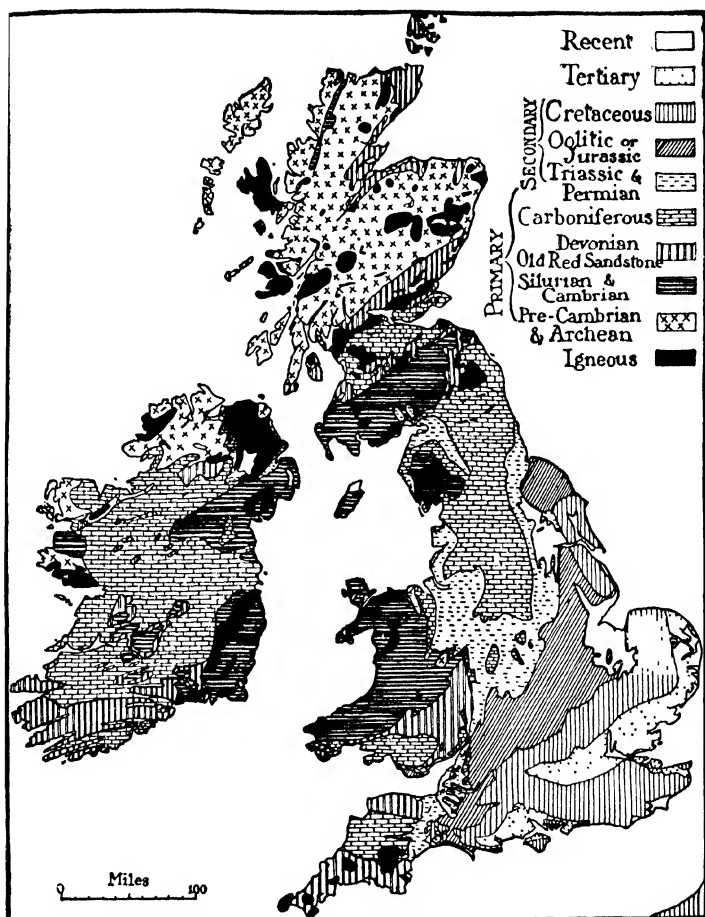
THE wealth of the world is in the rocks of which its crust is composed, the source of coal, petroleum, and all the useful and precious metals, of sandstone, limestone, granite, and other building-stones, and also of the mineral matter that provides food for plants. For plant-life, however, the mere presence of mineral matter is not sufficient ; water is required to form a solution which can be absorbed, and light and warmth to stimulate plants into activity. The study of rocks is therefore a most important matter, especially for peoples who have great industries.

Not however until men had become well acquainted with the distribution of land and water areas upon the globe, did they begin to give very serious attention to the study of the structure of the Earth's crust. The work, once entered upon, was followed up with great zest in all countries inhabited by white people.

Many valuable discoveries have been made, but most remarkable of all is the discovery that the history of the Earth, for a period of many millions of years, is recorded in the rocks of which the crust is composed. The reading of the record of the rocks is an important branch of Geology, a subject of such dimensions that it can be no more than briefly touched upon here, but the study of which has had a powerful influence upon human activities.

The waters of the Earth are ceaselessly engaged in the twofold process of destruction and construction. Ever since continents first reared themselves above the ocean, rain and rivers have been at work, wearing away the rocks, and carrying the sediment to lower levels—much of it into lakes and seas.

Sediment carried to the sea is deposited upon the sea-floor, where it forms a layer that slowly but constantly increases in thickness. At the mouths of the Mississippi, Po, Rhine, Nile, and many other rivers, the accumulation of sediment has actually risen above the level of the sea, forming a delta. When marine creatures die, their remains fall to the bottom of the sea to be buried—and “fossilized”—in the sediment; a like service is performed for plants and animal remains brought down by the rivers from the land. Pressure, and cementing materials such as silica, lime, iron-ore and others, bind the particles of sediment together as solid rock which we should describe as sandstone, limestone, clay, &c., according to its constituents. The direction of a river's course is determined by the slope of the land over which it flows, and changes on the land may so affect the drainage systems that



The Rocks of Britain. The surface rock greatly affects the life of a region through (1) the kind and quantity of soil, (2) the abundance or scarcity of water, (3) the character of the occupations, and (4) the position of towns and villages. The table in this map arranges rocks in the order of their age : (1) primary, (2) secondary, (3) tertiary, and (4) recent or quaternary.

sediment of a different kind may be laid down upon the original stratum.

Thus a record of vegetable and animal life on land and sea, and of changes in physical geography, is locked up in the rocks formed in lakes and seas, as faithfully as though written in a book. If in due course these rocks should be elevated and made dry land, the record will be there for those who will to read.

The above is a brief description of the mode of origin of sedimentary rocks. Some of the great discoveries of geology are: that the land areas of the world consist largely of such rocks; that the sedimentary rocks differ greatly in composition; that they contain stores of mineral wealth deposited by water, and fossils of plants and animals which indicate great variations in climate in bygone ages; that the whole series of sedimentary rocks can be divided into a number of groups, each of which records a chapter or stage of the Earth's history. Probably no country possesses a complete record of that history, but most of the stages are represented in Britain. Without attempting to deal with the geology of England in a formal manner, we will consider one or two areas that are of special interest.

Any one who visits a quarry in sandstone or limestone will recognize sedimentary rocks by their arrangement in strata, or parallel layers, and, on careful examination, by the presence of fossils, which are embedded in the rock. Seldom, however, are strata found to be horizontal. Often they may be seen bent into upfolds and downfolds, a result of crust movements caused by the contraction of the Earth's

interior. Sometimes such movements even cause great fractures in the strata, and the displacement of the rocks on each side of the fracture; such a displacement is called a "fault".

One important consequence of the tilting of the strata is that different kinds of rock crop out at the surface in different places, so that the geologist is able to examine rocks of different ages within a comparatively small area, and mineral wealth which would otherwise have remained hidden far below the surface is made accessible. These points are very clearly illustrated in several places in England.

The Rocks of South-eastern England. Notice, for example, the line of hill-ranges con-

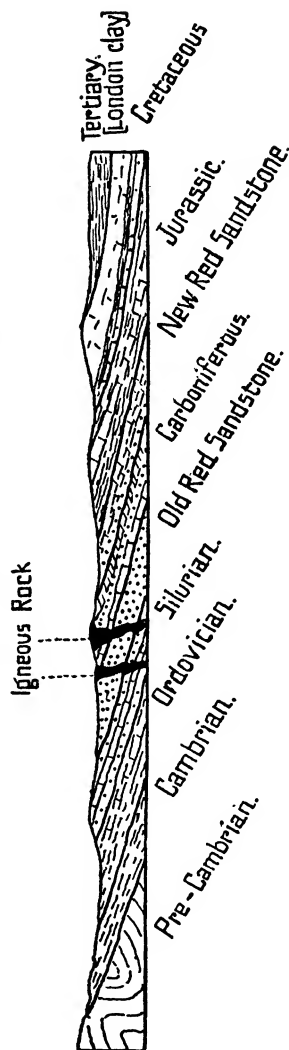


Diagram showing the succession of the systems of sedimentary rocks, and two dykes of igneous rock that have penetrated the strata. The diagram is intended as a guide to the relative age of the systems of sedimentary rocks; it may be regarded as a greatly simplified section across England from Shropshire to Essex.

sisting of the Berkshire Downs, Chilterns, East Anglian Heights, Lincoln Wolds, and Yorkshire Wolds. All these hills are built of chalk. They are in fact the *end* of a bed of chalk which dips towards the south-east under the London Clay, to appear in the North Downs. After a break in the Weald, the chalk bed is seen again in the South Downs, whence it dips under the sea, to reappear on the French coast; the Channel tunnel, if constructed, would be bored through chalk.

Going back to the Chilterns, it will be seen that a bed of clay, called Gault, crops out from under the chalk. Then come other beds of clay, sandstone, and Oolitic limestone, which form a group called the Jurassic system, famous as containing the remains of ichthyosaurus and other gigantic reptiles; the system is named after the Jura mountains. The Cotswolds mark the end of the Oolitic limestone, which received its name from the rounded grains of which it is composed (oolitic = eggstone) and which give it some resemblance to the roe of a fish. The end of the Oolitic limestone bed is seen also

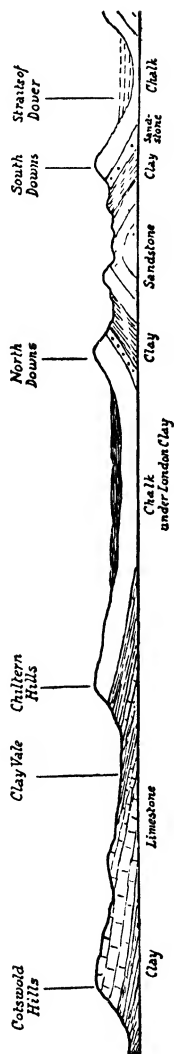
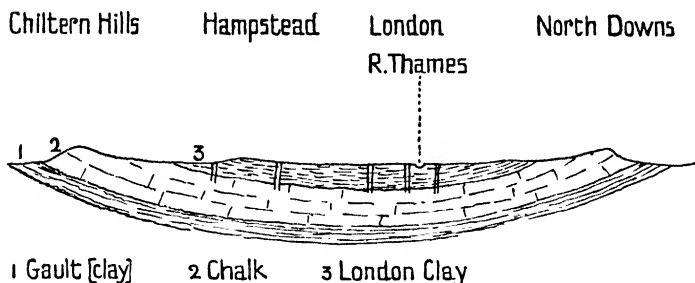


Diagram showing the geological structure of South-Eastern England.

in the Northampton Heights, Lincoln Edge, and the Cleveland Hills.

Chalk, limestone, and sandstone absorb water much more readily than do other rocks, and a down-fold of one of these, if underlain by an impervious bed of clay as in the London area, forms an important source of drinking-water reached by sinking artesian wells. One of the great achievements of the geologist



Diagrammatic section across the London Artesian Basin. The collecting ground for the water that supplies the artesian wells of London consists of the chalk country miles away from the city—the Chilterns and North Downs. Water is obtained by sinking wells through the London Clay into the chalk. The Bank of England, the fountains in Trafalgar Square, breweries, railways, &c., derive water from the bed of chalk.

is the determination of areas in which underground waters can be reached ; most important among these is the chalk region of Queensland and New South Wales.

The Carboniferous Rocks of Northern England. Another area possessing many interesting features is that portion of northern England occupied by the Carboniferous rocks. This most important system

has three members : (1) the Coal Measures, consisting of beds of sandstone, fireclay, ironstone, and coal ; (2) the Millstone Grit—a name which indicates a former use of the rock—consisting of sandstones, some of which are very coarse (grits), and shales ; (3) the Carboniferous Limestone series, consisting mainly of massive limestone, but containing beds of shale.

The Pennines are built mainly of Carboniferous Limestone, but many of the peaks have a cap of Millstone Grit, so there can be no doubt as to which is the older rock, whilst in many places Millstone Grit may be seen emerging from under the Coal Measures. These are remarkable facts ; there is Millstone Grit under the Coal Measures, and also two thousand feet higher—on the summit of the Pennines. To find an explanation we must trace briefly the history of the Carboniferous Age.

The Carboniferous Limestone is crowded with fossils of marine animals and plants, amongst which crinoids (sea-lilies) and corals are very numerous. The rock was evidently formed in a warm sea. Upon this limestone the Millstone Grit was deposited by rivers ; it must have formed large sandbanks about the mouths of the rivers. Luxuriant vegetation grew upon these sandbanks, and the region became a swampy forest. Rivers wandered slowly through the swamp, and apparently they deposited there a large amount of iron-ore, forming the ironstone beds worked in many coalfields at the present day. But the land was slowly sinking, and the forests were submerged, as in more recent times a forest has been submerged on the Cheshire coast. The rivers continued

Pennines were formed, and the great coalfield that stretched across northern England was divided into two parts. Later earth-movements resulted in the formation of four large coalfields—Cumberland, Durham, Lancashire, and Yorkshire—and smaller ones near Ingleton and Carlisle.

Rivers promptly set to work to strip off the smashed-up carboniferous rocks from the top of the Pennine ridge. The Coal Measures were entirely removed from the summit; in many places the whole of the Millstone Grit and part of the limestone was carried away; but some peaks, as we noted above, are still capped with grit.

Peat, lignite, and brown coal represent early stages, and cannel, humic or bituminous coal, and anthracite final stages, in the carbonization of vegetable matter; the percentage of carbon in this series of fuels increases from about 50 in peat to over 90 in anthracite. Lignite and brown coal do not differ greatly, except that in the former woody structure is more distinct; they occur in the Jurassic and more recent rocks, to a limited extent in Britain, in considerable quantities in Central Europe, and in vast deposits in the Rocky Mountain region of America. Anthracite has greater heating power than any other type of coal; the chief areas of production are South Wales and Pennsylvania (U.S.A.). Humic coal, containing a large percentage of hydrogen, is of greater general value; different varieties are known as house coal, steam coal, coking coal, and gas coal.

The New Red Sandstone Series. The movements which caused the uplift of the Pennines appear to have formed salt lakes similar to the Dead Sea, by

cutting off portions of the sea on each side of the mountains. This is the record of the New Red Sandstone series, which lies partly upon the carboniferous strata and contains beds of gypsum and rock-salt in Cheshire, magnesian limestone on the east of the Pennines, in a narrow belt between the Tyne and the Trent, and a thick salt bed near Middlesbrough. The richest deposits of this kind are found in Germany, where the New Red strata contain a bed of rock-salt nearly 4,000 feet thick, besides gypsum, potash salts, and magnesia salts. That the salt lakes were probably surrounded by deserts is suggested by the well-rounded particles of which the sandstones are composed, produced by friction under the action of wind.

The New Red Sandstone series extends over a broad area south of the Peak, partly covering the coalfields of the Midlands, and it contains valuable salt deposits worked at Droitwich. From the Bristol Channel it is continued as a narrow band to the Devonshire coast, though covered in some places by newer rocks. The magnesian limestone has been much used for building purposes—for the cathedrals of Durham and York and the Houses of Parliament—and for the manufacture of magnesian salts. Other strata in the New Red Sandstone series hold large quantities of water. For many years these rocks formed the source of supplies of water for a number of large towns, amongst which were Liverpool, Manchester, Nottingham, and Birmingham.

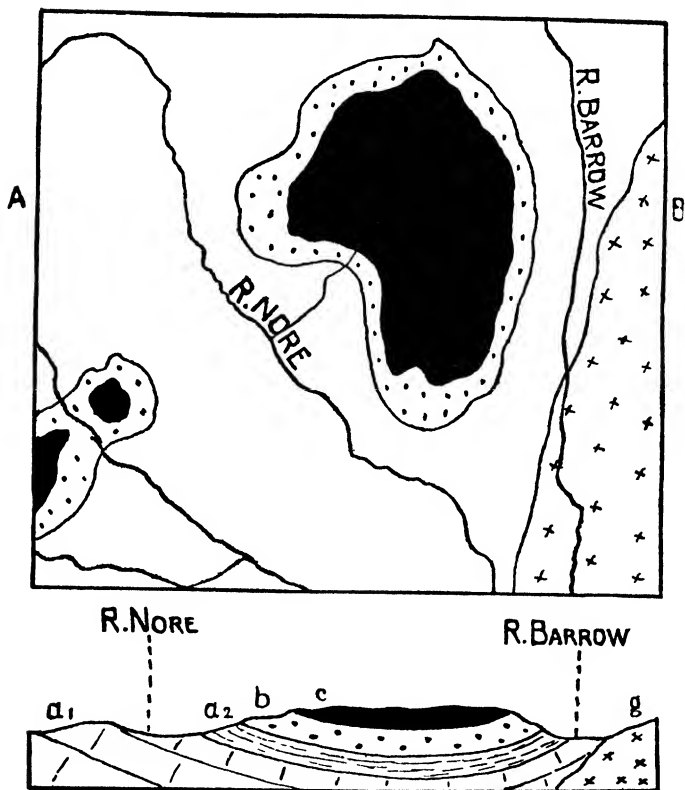
The Yorkshire coalfield extends in a south-easterly direction under the New Red rocks and the Jurassic rocks, and has actually been reached by boring

through these newer rocks in Lincolnshire, where coal is now being worked.

The Oldest Sedimentary Rocks. Wales is built almost entirely of rocks older than the Carboniferous series. Going in a north-westerly direction from the mouth of the Wye, we travel to older and older rocks. First there is the Old Red Sandstone which passes under the South Wales coalfield ; then come in order the Silurian and Ordovician, named after ancient British tribes, and finally the Cambrian series, which occupies a small area at the north of Cardigan Bay. Being the oldest of sedimentary strata the Ordovician and Cambrian series must have been subject to great pressure, and the rocks have acquired the property of splitting readily into thin sheets, which have a special value as roofing-slates.

The Coal Measures of Ireland and Scotland. Sedimentary rocks similar to those of the west and north-west of England occur in Scotland and Ireland ; their distribution and relation to English areas may be studied from a geological map of the British Isles. But two features which have had a most powerful influence upon human activities of the present day should be specially mentioned. Over a very large portion of Ireland the surface rock is Carboniferous Limestone. Denuding agents have evidently removed coal measures from a large area, leaving only one or two "stranded" patches in the south-west and in Kilkenny. Thus in bygone ages the country was deprived of valuable rocks which, had they remained, might have made Central Ireland of to-day a region like the English "Black Country".

In the Lowlands of Scotland, on the other hand,



Plan of the Kilkenny coalfield and section along the line joining A and B. (a_1 , a_2 = Carboniferous Limestone and Shales; b = Millstone Grit; c = Coal Measures; g = Leinster granite.) (In the upper drawing Limestone and Shales are white.)

coal-bearing strata have been preserved. The Lowland area is a "rift valley" formed by the subsidence of a broad belt of land between two systems of faults

which extend across the country. The subsidence had the effect of protecting the Coal Measures from denudation, and so making the Lowlands suitable for industrial development.

Pre-Cambrian Rocks, Igneous Rocks, and Metallic Ores. North of the Scottish rift valley lies the Highland region, built of rocks we have not yet mentioned. They are very hard crystalline rocks named gneiss and schist, more ancient than any referred to above and believed to be the "foundation of the earth"—the first solid ground to exist upon the globe. Rocks of this same Pre-Cambrian type are to be seen in the north of Ireland, and they occur over wide areas in every continent, forming the central core of the great mountain systems, and entering largely into the structure of such plateaux as Scandinavia, Labrador, Western Australia, and the highlands of Africa.

The ancient rocks are the original source of the valuable metallic ores, and there must be huge stores of iron and other metals deep within the Earth's crust. The metallic ores near the surface have been brought upwards largely by volcanic agency. There is abundant evidence of periods of volcanic activity in the north and west of England, in Scotland, and in Ireland. In addition there are large masses of granite in Cornwall and Devonshire, the Lake District, Scotland, and Ireland, indicating that molten rock was thrust into the sedimentary strata from below, but did not actually reach the surface.

The intrusions of igneous rock produced a large number of fissures in the adjacent strata, and these were in many cases filled in with ore, brought from

below in the form of vapour or hot solutions. This explains the presence around the granite areas of Devon and Cornwall of copper, iron, lead, tin, antimony, bismuth, tungsten, and other minerals. In the Kiruna district of Sweden and the Adirondacks of America, large masses of iron-ore are associated with the igneous rock itself, and more occurs in the surrounding veins.

Generally, however, the metallic ores in igneous rocks are scattered through the mass in small particles, and are therefore unworkable. Surface waters have done great service in the distribution of minerals, by dissolving and collecting the ores in igneous rocks and storing them in sedimentary rocks. One such example, the accumulation of iron-ore in British coal measures, has already been mentioned; there are similar beds in the coalfields of Europe and North America. Both hematite and lead ore have been stored in large quantities in fissures and hollows of the carboniferous limestone. The lead deposits are worked in many parts of the Pennines and the Lake District, the iron ore in the Furness district of Lancashire and parts of Cumberland. A large quantity of iron ore occurs in the Jurassic rocks, and it is worked in the Cleveland Hills and the Midlands.

Sometimes ores or native metals are deposited by streams in gravels; such deposits are called "placers". A large part of the world's gold has come from placer-workings in Australia and other lands, though at the present day most is being obtained by mining. Tungsten, the metal used for making high speed steel, and electric lamp filaments, is obtained in considerable quantities from placers in Burma.

Petroleum, formed deep within the earth's crust, probably from vegetable and animal matter, is found in rocks of different ages. Oilfields occur most commonly along lines parallel to great mountain systems, such as the Carpathians, Caucasus, Appalachians, Rockies, and Andes, or near the site of mountains that have disappeared under the action of denuding agents. The chief oil-producing regions at the present day are Azerbaijan (Caucasus), America, Rumania, Persia, Burma, Mexico, Canada, Peru, and New Guinea.

In concluding this chapter a word should be said about recent deposits. The solid rocks have been referred to as reaching the surface, but this is not the case everywhere. Over a large part of the British Isles a layer of boulder clay was deposited by the glaciers of the Great Ice Age, and the same is true of northern and central Europe, and the northern part of North America. In addition there are many deposits of river gravel—some laid down within historic times. Where these deposits exist they constitute the soil, generally, however, mingled with material resulting from the breaking-up of the surface of the solid rock, which forms the soil elsewhere.

EXERCISES

1. Read *The Changeful Earth*.
2. In what parts of the United Kingdom are there stores of coal, iron, lead, granite, salt? Make a sketch-map to illustrate your answer.
3. Name important ore-producing regions in distant parts of the world, stating the particular ore worked in each case.
4. What conditions are necessary for the accumulation of supplies of water below the surface of the ground?

4. CLIMATE

CLIMATE is the great controller of human life and activities, determining not only what crops man shall grow, how he shall feed and clothe himself, but also the portions of the Earth's surface that he shall inhabit, and the rate of progress of civilization in different regions.

The surface of the Earth is divided into five climatic zones which "shade off" one into the other. The torrid or hot zone is that belt over which the sun appears to travel during the globe's annual revolution. At places in this belt the midday altitude of the sun is never less than 43° , and twice during the year it is 90° .

The north frigid and south frigid zones are enclosed by the Arctic and Antarctic circles respectively. They are regions in which the sun is never seen at an altitude greater than 47° ; on at least one day in winter it does not appear above the horizon, and on at least one day in summer it does not set. The number of such days increases towards the centre of each zone, until at the Pole itself there is six months darkness and six months light alternately.

In the two temperate zones the sun is never in the zenith, and it never fails to rise and set on each day during the year. Still at places near the Tropic of Cancer (or Capricorn), the sun has an altitude of nearly 90° on the 21st June (or 21st December); and at places near the Arctic circle it hardly rises above the horizon, or sinks below it, on the 21st December and the 21st June respectively.

The change from tropical to temperate and from temperate to cold climate, due to increasing obliquity of the sun's rays, is a very gradual one ; there is no appreciable change in climatic conditions as a result of passing over the boundary of a zone.

If the surface of the Earth were uniform in character, say covered with water, the climate of any portion would depend upon its latitude ; and the isotherms of the world, that is the lines joining places which have the same average monthly temperature, would run along parallels of latitude.

But the surface of the globe consists of great land areas separated by oceans and penetrated by seas. Land and water have unequal capacities for heat. Taking equal quantities (by volume) of water and sand, and raising their temperature by 1° , it is found that water requires twice as much heat as does sand ; on cooling through 1° , the water will yield twice as much heat as the sand, and it cools at a slower rate.

Thus, when land and water in the same zone receive heat rays at the same angle, the temperature of the land and of the air above it speedily mounts higher than that of the adjacent water. When the supply of heat is cut off, the land soon becomes cooler than the water. This explains, in part at any rate, the bends to north and south of the isotherms.

The variation in direction of isotherms is particularly noticeable in the northern hemisphere, in which the largest land areas of the world are found. The July isotherms show generally a northward bend over continents, whilst those for January have a southward bend over continents and a northward

bend over oceans. In both the Atlantic and the Pacific the top of the bend is near the eastern side of the ocean, as a result of the drift of warm waters in a north-easterly direction, under the action of the westerly winds. The North Atlantic Drift spreads its influence far into the Arctic region.

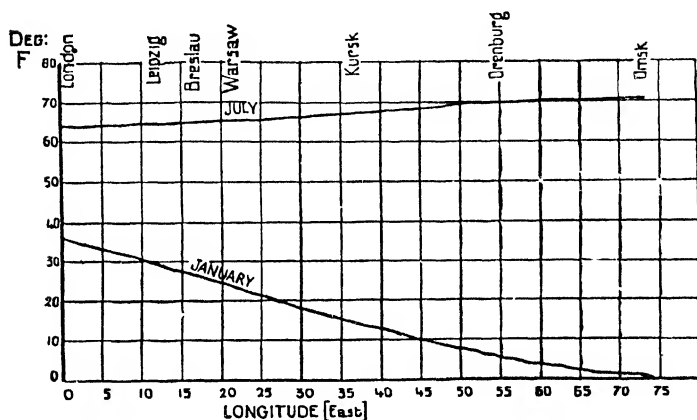


Diagram showing the mean temperature for January and July at certain places in Eurasia.

Summing up the preceding paragraphs we may say, (1) in winter the North Atlantic and North Pacific are warmer, and in summer they are cooler, than land areas in the same latitudes ; (2) places on the eastern shores (or western margins of the continents) are warmer in winter than places in the same latitude on the opposite side ; (3) continents experience a much greater range of temperature than do oceans, in the course of a year.

Hence it has become customary to describe climate

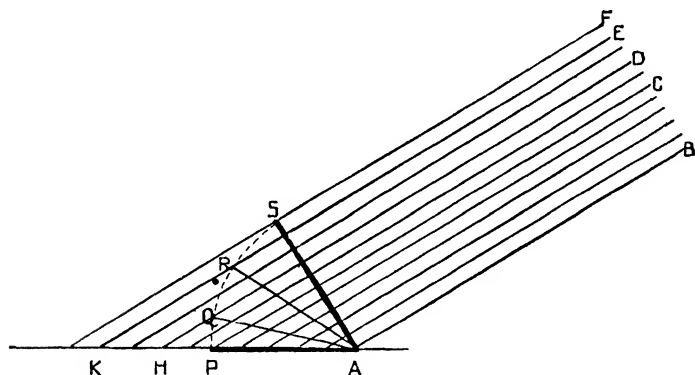
as "continental" or "oceanic" according as it is extreme or equable. The places where the oceanic type really prevails are islands such as the Sandwich Group and others in the Pacific, remote from great land areas; it is enjoyed in a moderate degree by Britain and other islands near big land areas, as well as by those parts of continents not very far from the sea. How fortunate are places on the margin of a continent in comparison with those in the interior, may be learned by examining the diagram given on page 37.

Without even leaving the torrid zone, climate of every type from tropical to arctic may be experienced by ascending high mountains. This is a fortunate circumstance. The plateaux of Mexico and East Africa have hot and very unhealthy shorelands, but the climate of the high interior is quite suited to Europeans. British people resident in India may obtain relief from the heat of the plains by withdrawing to the hill-stations at Simla and Darjeeling during the hot season.

The fall in temperature with increasing altitude is roughly 1° F. per 300 ft.; this rule holds of course in each zone. For general purposes temperature maps are constructed with isotherms "reduced to sea-level", that is, in plotting the reading taken at any station, proper allowance is made for the altitude of the station above the sea.

Reference has now been made to the chief factors that influence climate—latitude, altitude, ocean currents, proximity to the sea. There are, however, several minor factors, amongst them being slope of the land and direction of prevailing winds.

The former may best be considered with the aid of a diagram, which represents, in section, a bundle of rays falling from the sun when its altitude is 30° , and the edge of a square board. When the board is horizontal (AP) it receives all the rays below PC. As it is tilted, first to AQ, then to AR, and finally to AS, it catches more and more rays. In the position AS, the board is receiving the maximum amount



of heat; rays are striking its surface at right angles, and in this particular case the number is twice as great as when the board was at AP.

This is sufficient to show the effect of a sun-ward slope. The value of a southern slope for crops that require abundance of light and warmth is recognized by British gardeners ; in New Zealand the valuable slope is, of course, that which faces north.

Rainfall may be regarded as the most important of the elements that constitute climate; where it is most abundant the earth is most richly clothed

with vegetation, and where it is wanting neither plant nor animal can exist.

Rain comes originally from the exposed surface of the waters of the globe. Water vapour passes into the atmosphere, and reaching regions of low pressure is cooled, formed into clouds, and ultimately thrown down as rain, snow, or hail; some of the vapour in the atmosphere is frequently deposited on cool surfaces in the form of dew or hoar frost.

It is in the distribution of rainfall upon the land that winds exert their most powerful influence upon climate; they carry clouds from sea to land. It should be remembered, however, that the belts of constant winds and calms shift northwards and southwards, "following the sun"; consequently places on the borders of a wind-belt are sometimes within and sometimes without the range of a particular wind system. They receive seasonal rains.

One of the wettest regions in the world is the equatorial low-pressure belt towards which blow the trade winds. In this belt hot moist air is continually rising, and heavy falls of rain occur with great frequency; hence the shorelands of equatorial Africa and South America are unhealthy, especially for Europeans.

The trade winds blow in a westerly direction, and therefore carry rain to those portions of the eastern continental margins that lie in latitudes of roughly 10° to 30° . The corresponding regions on the western margins of the continents are very dry; they include the Arizona and Sahara deserts in the northern hemisphere, the Atacama, Kalahari, and Westralian deserts in the southern hemisphere.

On the other hand, the stormy “Westerlies” which prevail in higher latitudes, from about 35° to 65° , carry rain to the *western* margins. But complications are introduced by cyclones or low-pressure systems, which travel from mid-ocean to the western margins at all parts of the year. They are wet weather systems, as British people are well aware. As a result of the shifting of the wind belts, the Mediterranean region and the west of North America from California to British Columbia receive practically all their rainfall during the winter; the summer is generally very dry.

In the southern hemisphere New Zealand and the southern part of Chile lie in the west-wind belt, and they are also visited by cyclones. The south-western corners of Africa and Australia come under the influence of the west winds when the belt shifts northward, during the southern winter, and these regions may be compared with the Mediterranean.

India and South-eastern Asia form a special region with two seasons, one hot and wet, the other cool and dry, according as the monsoon blows from sea or land. The low pressure established over the interior of Asia during the northern summer causes monsoon winds to blow from the Indian and Pacific Oceans; they carry with them huge quantities of moisture. During the winter months the low pressure is located over the ocean, and the winds blow seaward.

In the case of India the summer monsoon approaches from the ~~south-west~~ south-west. From the heated slopes of the Western Ghats, the Himalayas, and the Burmese mountains warm ascending currents of air carry the clouds to great altitudes, and torrents of

rain fall upon the seaward sides of the mountains. Chirapunji in the Khasi Hills holds the world's record

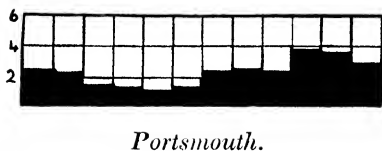
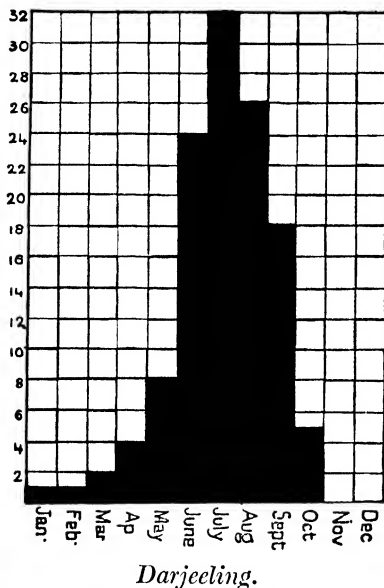


Diagram showing average monthly rainfall at Portsmouth and Darjeeling, on same scale.

for mean annual rainfall—500 in. At Darjeeling and Bombay the annual rainfall is 121 and 100 in. respectively.

Monsoon conditions prevail over Siam and eastern China, in northern Australia and the north-east of Africa (Abyssinia), and in a less marked degree in the Americas, north of the Gulf of Mexico and south of the Caribbean Sea.

If the monsoon wind does pass beyond the Himalayas it can only be as a dry wind, more ready to pick up than to yield moisture; and beyond the mountains there lies a vast region — Tibet, the Gobi desert—where rain hardly ever falls. Tibet is a lofty plateau, quite distinct from the deserts that lie below, in an

'Takla Makan desert and the

irregular hollow between the Himalayas and the Altyn Mountains ; the hollow is from three to five hundred miles in width, and some two thousand miles in length.

The deserts are fringed with scrub and poor grass-land ; and this is the type of region that extends to an area of over 3,000,000 square miles in Central Asia. It is continued westward beyond the Thian Shan mountains as a deep depression in which lie some great salt lakes, the Caspian and the Sea of Aral. Once these were united, and also joined to the Mediterranean ; now they are separated by a waste of sand.

With the exception of some minor breaks, this great desert region is continued through Persia, Arabia, and northern Africa almost to the shores of the Atlantic.

EXERCISES

1. Name regions that are rendered unfit for human habitation by adverse climatic conditions. Show the distribution of such regions on an outline map of the world.

2. What are the advantages of a southward slope in a garden ? For what plants in particular would you use such a slope ? In which countries would a northward slope be preferable ?

3. The average monthly temperature at Fort William is 39° in January and 57° in July. What would you estimate the average to be at the summit of Ben Nevis (4,406 ft.) ?

4. Explain the terms "oceanic" and "continental" as applied to climate. Name places which have such climates.

5. Describe the Mediterranean type of climate and mention other regions which have similar climate.

5. THE WORLD'S PEOPLE

Distribution of Races. Until the end of the fifteenth century, the region occupied by the white race consisted of south-western Asia, northern Africa, and nearly the whole of Europe. The yellow race was settled in the north and east of Asia, the Americas, and one or two small detached areas in Europe. The black race was in possession of Africa south of the Sahara.

Since the beginning of the sixteenth century there has been in progress a great movement of the white race, whilst the yellow and black races have engaged in movements on a smaller scale.

In addition to the territory mentioned above, the white race now occupies almost the whole of the Americas, Australia, New Zealand, and South Africa; a wedge of white population has also been driven through Siberia to the Pacific shores. In each of these lands native population is still in existence, though in some cases their numbers have greatly diminished. In Canada the aborigines form about 1·5 per cent. of the total population; but in the United States and Australia the percentage is less than 0·5. In Mexico, on the other hand, "Indians" form the bulk of the population.

The movement of the yellow race has been confined to the Asiatic portion. Asiatics have settled in each of the new lands occupied by white people, but their entry has always been strongly opposed by the whites. In North America there are in the Pacific region about 150,000 Chinese; further immigration of

Chinese labourers has been prohibited. In New Zealand and the Australian Commonwealth the numbers are much smaller, 2,500 and 50,000 respectively. Under the Immigration Restriction laws of these colonies, yellow people seeking to enter must pass a language test—English in the case of New Zealand, some European language in Australia. The Commonwealth government have before them as an ideal a “white Australia”; but their immigration returns show that during the ten years ending in 1917, over 20,000 yellow people were admitted without test.

Black-skinned people have never shown a great desire to settle in lands other than their own, being found in great numbers only in the United States and the West Indies. Hither negroes were taken by force during two centuries, to work as slaves on sugar and cotton plantations. All slaves were freed in 1865, and their descendants in the United States form about 10 per cent. of the population. There is a fairly large number of negroes in South America, especially in the hot plantation regions of the northern part.

Having made this brief summary of the distribution of the three great races, we can follow up the subject of population without further reference to “colour”.

Population of the Continents. The population of the world, supposed to be about 1,600 millions in number, is distributed very unevenly. Over 800 millions live in Asia, and more than seven-eighths of these are concentrated in the monsoon regions. The population of Europe is about 400 millions, and nearly half is found in four countries—Britain, France, Germany, and Italy. There are more people in London than in the whole of Australia; three times

as many in North America as in South America, and as many in Africa as in the two Americas together. Half of the people in the United States live in the north-eastern portion, in one-eighth of the total area, and practically the whole of the Canadian population is found in a narrow belt in the south.

When these statements are considered together with the character of the lands mentioned, it will be seen that several factors—climate, possibilities in the way of food-production, facilities for communication, industries, and commerce—control the distribution of population ; climate is of outstanding importance.

Polar Regions. Because of the severity of the polar climate, the Antarctic continent and the islands of the Arctic Ocean are frozen deserts. It is the long and cruel winter that sets a limit to the number of people that shall carry on a precarious existence in the northern portions of Eurasia and America, and that drives men, animals, and birds southward when the short summer is over. A no less cruel rainless climate prohibits human settlements in the Gobi desert, in the Australian deserts, and, except in oases made fruitful by waters from underground, in the Sahara.

Highland Regions. Generally, mountain areas have a small population, partly for climatic reasons, partly because of inaccessibility and the absence of suitable land for food-raising. In such cases as the Alps and Himalayas the snow-line definitely stops man's advance to higher ground. Tibet, on the northern side of the Himalayas, is an exceptional region, being one of the loftiest inhabited areas in the world. Europeans do not know much about the country

except that it is rugged, inhospitable, and thinly peopled.

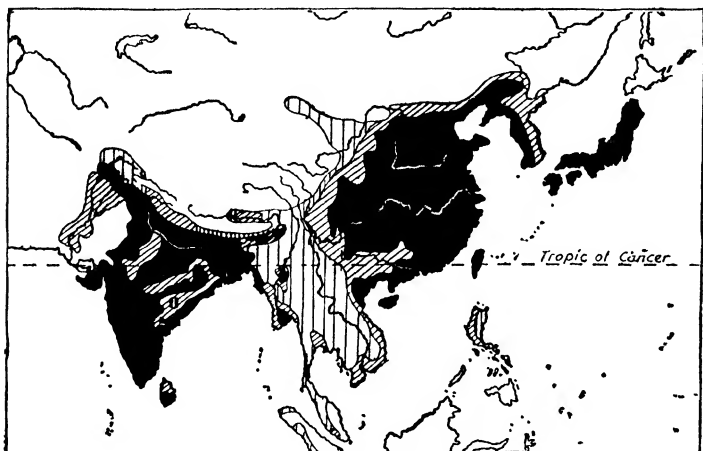
On the other hand, it is the cool climate of great altitudes that favours human settlements in some tropical lands ; but for their elevation, it would be impossible to contemplate the colonization of British East Africa and Uganda by white men. In the Andes there are large towns such as Quito and Bogota, situated over 8,000 ft. above sea-level. Both of these have a beautiful climate, though they are not far from the equator. It should be remembered, however, that people who have always lived in lowlands cannot easily accustom themselves to the conditions of great altitudes ; they are liable to mountain-sickness and headache.

River Valleys and Plains. From the earliest historical times, river valleys and plains have possessed a wonderful attraction for mankind. The river itself provides drinking-water, a highway for trade, and means of irrigating the land during dry seasons. The alluvial soil of the valley and the plain, on to which the valley opens is finely divided, fertile, and deep, frequently enriched by deposits from the river in times of flood, and capable of yielding heavy crops.

Asia and Africa. It was in such places, in the valleys and plains formed by the Nile, Euphrates and Tigris, Ganges, Hoang-Ho and Yang-tse-Kiang, that the first civilized states were established. Systematic agricultural work brought regular harvests of rice or millet ; thus it was possible to live a settled life and to make progress in the arts of civilization.

The condition of such peoples may well be contrasted with that of the inhabitants of the steppes or

grasslands, that lay between their own territory and the deserts. The steppe-dwellers, unable to practise agriculture because of the dry climate, were dependent for food and clothing upon their animals, and for the sake of their flocks and herds were condemned to a nomadic life—wandering from one pasture-land to



Density of Population in the Monsoon Lands. White, below 15 to the sq. mile; vertical ruling, 15 to 50; slanting ruling, 50 to 100; black, over 100.

another. They were the semi-savage tribes that sometimes raided the rich agricultural regions of Asia and Europe.

The use of the past tense in the preceding paragraphs does not mean that the conditions are greatly different at the present day. Raids are uncommon, but the steppes of Asia are still thinly peopled, and by nomadic tribes. The inhabitants of the valleys and

plains are still almost wholly agricultural ; and with the exception of the Euphrates region these valleys and plains are amongst the most densely peopled parts of the world to-day. But whilst the steppes remain unchanged, modern engineering methods have been applied to irrigate the land and protect the teeming populations of India and Egypt from famine.

Second to Egypt amongst African regions with great population comes that portion of the continent bounded by the Sahara on the north and the Kalahari desert on the south. A large part of it, including a broad coastal belt north of the Gulf of Guinea, and the whole of the Congo basin, is heavily forested ; but there are many human settlements in cleared areas. The rest is savanna land, a summer rainfall region ; the northern portion is named the Sudan.

The mode of life of the people of this vast region depends upon the nature of the country in which they dwell. In the savanna portions the chief food crops are durra (millet) and maize ; the occupations are mainly pastoral and agricultural. In the forests the food crops are maize, plantains, bananas, and yams, and the people are engaged in agriculture, hunting, and the collection of forest products. West Africa and the Congo have long been of interest to the commercial world as a source of palm-oil, rubber, and ivory.

Though the whole of this region is occupied by native population, various portions have been appropriated by European powers—Britain, France, Belgium, and Portugal.

The only densely peopled portions of South Africa are comparatively small areas around the three ports

Cape Town, Port Elizabeth, and Durban, and the mining region of which the centre is Johannesburg.

Europe. Europe is in many respects the most favoured of continents. It possesses neither rainless deserts nor impenetrable forests, no tropical region, and practically no Arctic region. It is therefore not surprising to find that no other continent has so small a proportion of its area unoccupied. Indeed, it can hardly be said that any part of Europe is really unoccupied, though northern Russia, and the highlands of Scandinavia and Scotland, are only thinly peopled.

We have noted that in Asia and Africa population is most dense where the land is most productive ; in Europe, fertile areas are certainly well peopled, but the most densely populated regions are those in which textile and iron industries are carried on. At present these industries are located either on or near to coal-fields, though there are some exceptions ; and the coal-producing countries, especially Britain, Belgium, Germany, and parts of France, have areas crowded with manufacturing towns, where agriculture is of quite minor importance. Though Holland and the north of Italy do not possess coalfields, they have a large industrial population.

The rest of the continent, excepting the northern portion and mountainous areas, is overspread by human settlements in remarkably even fashion ; but there is a gradual diminution in density of population towards the east, to be explained partly by the increasing severity of winter, and partly by remoteness from commercial centres.

We have in Europe and Asia striking illustrations

of the influence of physical conditions upon the rate of progress of nations. China, for example, is a large country with great physical barriers in the shape of mountains and deserts, that shut off the land from other regions and favour the development in its people of that exclusiveness which is sometimes said to be the attribute of islanders. Europe, on the other hand, is a continent of peninsulas separated by narrow seas, which, whatever they were in ancient days, have been in historic times most valuable means of communication.

It is hardly possible to doubt that commercial intercourse, the consequent interchange of ideas and stimulation of international competition, invention and discovery, account for the marvellous advance of western nations compared with that of the Far East.

The Japanese opened wide their gates to foreigners, and rose from insignificance to the rank of a great power in less than a century. The resources of China are infinitely greater; as regards mineral wealth she is believed to be the richest country in the world. She has opened her gates, and the rise of Japan is a hint as to what may happen in the case of China.

North America. With the entry of Europeans into North America, the eastern portion of the continent began a process of transformation corresponding to that which has been effected in Europe, but at eight times the rate. The Americans have done in 250 years what was done in Europe in 2,000 years; but of course they began the work possessed of all the knowledge that had been accumulated in Europe. A wilderness has been converted into a typical white

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man's land, with agricultural areas, mining and manufacturing regions, and commercial centres.

The population has increased by leaps and bounds, continually aided by immigration. During the twenty years preceding the European War, the United Kingdom alone contributed over 2 million people to the United States, and over 1½ millions to Canada.

At present the area of dense population extends to the Missouri in the States, and up the St. Lawrence basin to Lake Huron in Canada. But for some time the tide of population has been flowing strongly into the great region called the "middle west", and ten-year-old population maps are out of date. In Canada especially railway building in the middle west has been closely followed up by settlement—an illustration of the fact that the distribution of population is governed partly by facilities for communication.

Free farms, for ranching or wheat-growing, have done a great deal to attract population to the middle west. Irrigation schemes have been carried out to compensate for the dry climate, and in this work the railway companies, influenced doubtless by both patriotic and commercial motives, have taken a prominent part.

The Pacific shoreland of North America is not thickly peopled except around Vancouver, at San Francisco, and at Los Angeles. The last furnishes an interesting example of the attraction of population to a place by the establishment of a special industry—film-making.

The Southern Continents. South America and Australia are alike in having a belt of populated country around a thinly peopled interior; the one

interior has too much vegetation, whilst the other has not sufficient.

An interesting feature in connexion with the distribution of population in Australia is the large proportion congregated in the capital cities. The figures below are from the Official Year Book of the Commonwealth for 1918.

<i>State.</i>	<i>Estimated Population 31st Dec. 1918.</i>	<i>Capital.</i>	<i>Population.</i>	<i>Percentage on total of State.</i>
New South Wales	1,930,240	Sydney	792,700	41·07
Victoria	1,430,758	Melbourne	723,500	50·57
Queensland	694,440	Brisbane	181,199	26·09
South Australia	445,708	Adelaide	235,751	52·89
Western Australia	313,447	Perth	133,000	42·43

For the sake of comparison the corresponding figures from the 1921 Census returns of England and Wales are given :

<i>Population of England and Wales.</i>	<i>London Administrative County.</i>		<i>Greater London.</i>	
	<i>Population.</i>	<i>Percentage.</i>	<i>Population.</i>	<i>Percentage.</i>
37,885,342	4,483,249	11·8	7,476,168	19·7

South America has a greater population than Australia, its thickly-peopled belt is more continuous, and its vast interior is much more promising as a home for mankind. The most densely peopled areas are in the neighbourhood of the great ports, Buenos Aires, Rio de Janeiro, and Valparaiso. Next come small areas about Bogota and Caracas in the north, Bahia and Pernambuco in Brazil, and a portion of Peru.

But none of these has a really dense population, and, following the example set in British colonies, the governments of South American states hold out

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inducements to settlers of good type. The Peruvian government, for example, announced in the spring of 1920 that they would pay the passage of white settlers and their families, provide board and lodgings for six days, and pay the cost of conveyance to any part of the Republic—provided the intending settlers were of good character and passed a medical examination.

South America is in fact a continent with enormous areas of thinly-peopled land suitable for cultivation, some in the torrid zone and some in the temperate zone, thus providing a field of emigration for the people of every other continent.

EXERCISES

1. Name countries which have (a) a very dense population, (b) a thin population, giving the reason in each case. Mark each area on an outline map of the world.
2. On the map of the world used in Exercise 1, mark areas in which large numbers of the yellow and the black race have settled.
3. For what reasons do the governments of certain countries advertise for settlers? What kind of settler is usually required?

6. THE WORLD'S WORKERS

UNDER primitive conditions, families were more or less independent, each consisting of a small group of workers supplying their own needs in the way of food, clothing, and shelter. Even in the Middle Ages the farmer in Britain and other lands raised food for his family, brewed ale from his own hops, provided

raw wool which was manufactured in his own home, erected buildings for himself, and generally contrived to "carry on" without external aid.

At the present day such a mode of life is very exceptional, being found only amongst semi-civilized tribes in tropical and arctic regions. The most outstanding feature in the life of civilized peoples is the dependence of one section of the community upon all the others, resulting from specialization in occupations.

The occupations followed by the world's workers seem almost infinite in variety; but, following the plan adopted in the official year-books of Australia and New Zealand, we may divide them into some half-dozen groups as set out below. We will not attempt to arrange them in order of importance, except to place first that group of occupations upon which the population of the world depends for means of subsistence.

1. The Primary Producers Group includes all those workers who are engaged in agriculture, pastoral work, and other forms of labour the object of which is the extraction of foodstuffs and material from natural sources. Within this group are therefore included agricultural workers of all kinds—the British and American farmers with their up-to-date machinery, the Chinese labourer with his primitive implements, and the semi-savage tribes who simply collect forest products; the flax-growers of Russia and the plantation workers of tropical regions; the ranchers of the Great Plains of America; the pastoral nomads of the Asiatic steppes and the Lapps of northern Europe; the crews of steam trawlers in the North Sea and the

Eskimos in their kayaks in the Arctic Ocean. As extractors of natural commodities, miners belong to this group, though in Britain the coal-miner in particular is generally classed with Group 2; but coal is passed on to the consumer without undergoing any manufacturing process. Other primary producers are lumberers, quarrymen, hunters and trappers of fur-bearing animals, sponge-dredgers, pearl-divers, &c.

2. The Industrial Workers Group includes all those people engaged in the work of putting natural food-stuffs and raw materials through processes which render them fit for the consumer. In this class are the people employed in the creameries and condensed-milk factories of such countries as Denmark, Switzerland, Ireland, Canada, and New Zealand; the meat packers in the factories and freezing works of Chicago, New Zealand, Australia, Argentina; the workers in the saw-mills and pulping mills of America and Sweden; the carpet-makers in the "tents of Kedar" and in the factories of Halifax; textile workers in the cottages of Donegal and the Hebrides, and in the huge factories of northern England, the Continent, China, Japan, and other countries; the workers in iron and steel, glass, chemicals, and many other commodities.

3. Transport and Communications Group. There are many people whose activities are too varied to allow of their being placed in any one group. Many a British farmer feeds cattle for milk and manufactures butter which he conveys to market direct to consumers. Thus he combines the activities of four groups—primary producer, industrial, transport, and commercial. But specialization in industry, produc-

tion on a large scale, and the development of international trade have brought into existence a group of workers, ever increasing in numerical strength, specially concerned with the conveyance of passengers and goods and the transmission of messages. This group includes the crews of vessels on the ocean and inland waters, railway workers, and those concerned with road transport by motor, steam-lorry, tram-car, and horse-drawn vehicles, as well as postal workers of all grades. The transport workers establish links between primary producers and industrial workers, between industrial workers and commercial workers, and between commercial workers and the consumers.

4. The Commercial Group of workers consists of those who are concerned directly or indirectly with the sale and distribution of goods. They stand between the primary producers and industrial workers on one hand and the consumers on the other ; some have a direct connexion with manufacturing firms, but many are quite independent. Their special function is to find markets—markets in which to buy from producers, and markets in which to sell to consumers. But this group does not consist only of those connected with international trade, and the wholesale and retail trades at home, but also of workers in banks and insurance houses. The banker is sometimes described as a professional man, but his work consists largely in facilitating commercial transactions. Insurance companies assist commerce by protecting traders against loss through the destruction of goods and property by shipwreck, fire, and other causes.

5. The Professional Group includes the members of

the legal, medical, and teaching professions, and those whose energies are devoted to the Church, music, journalism, science, art, and amusements. In this group also are those concerned with the government of the country and its subdivisions. Naval and military officers are usually classed as professional men, though navy, army, and police force might well form a separate group.

6. Domestic Workers is a term that hardly needs explanation, but it should be remembered that in this group come not only those engaged in household duties, but also people performing similar work in hotels, on railway trains, and on ocean-going vessels. The group is strong numerically; in the case of England and Wales, for example, the Census returns for 1921 gave the number of domestic workers as 2,046,825.

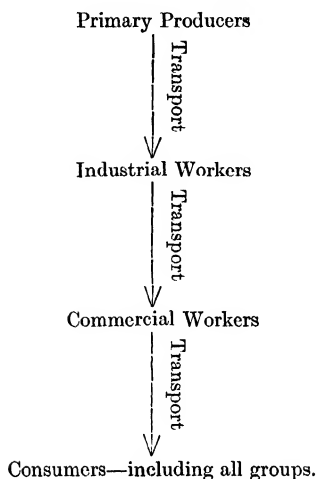
In this book we are concerned mainly with the labours of the first four groups and a portion of the fifth group. All the continents will be considered with a view to discovering the resources of each, and the nature of the activities of the working population. It will be found that there are striking differences between the resources of portions of the same continent—or of the same country—due to a number of causes, amongst which are climate, configuration of the land, and distribution of minerals; there are corresponding differences between the activities of the inhabitants of the respective areas.

Some regions, for example, chiefly those parts of the torrid zone that have a damp climate, may be described as plantation regions. They are planted with trees or shrubs which yield crops year after

year, and are the sources of such commodities as rubber, palm-oil, cotton, tea, sugar, coffee, and cocoa. They are altogether different from the valleys and plains of temperate lands, where much labour has to be expended in preparing the ground and sowing it with seed each year; whilst both are quite unlike the dry grasslands that occur in the interior of each continent and on such plateaux as Tibet and Asia Minor, where the raising of crops is a matter of great difficulty, and the land is used mainly for pastoral work.

The differences mentioned in the preceding paragraphs are due to variations in climate and configuration, but in many countries the most important factor in determining the activities of the people is distribution of mineral wealth. Great Britain is a good example; for, excepting London, nearly all the industrial and commercial workers are congregated in the areas that yield coal and iron. Even in such areas the primary producer is at work on all available land, feeding his cattle and raising crops—doing what is after all the most vital kind of work.

It is rather important to notice, however, that neither the primary producers nor any other group is independent of the rest. The primary producers pass on their raw material to the industrial workers, who pass on the product of their labour to the commercial workers, who in turn distribute to consumers; whilst the researches of professional workers have always been the mainspring of progress in both primary production and industries. The transport workers are in requisition at each stage, as shown on the following page:



The elimination of any one group would be like breaking one of the links of a chain. So far as Britain is concerned, the first transport link is composed mainly of the men engaged in over-seas trade, who make the connexion between the commercial and industrial workers at home and the primary producers in every region of the globe.

Remembering that the greater part of the foodstuffs and raw material consumed in Britain is imported, we realize that a chain of well-organized workers at home is not in itself sufficient; British activities are rendered possible by the labours of primary producers beyond the seas. Storm and drought and famine in distant lands have effects that are felt in Britain—curtailing perhaps the supply of some commodity, or, by reducing the spending power of the afflicted people, restricting the market for British goods.

EXERCISES

1. Explain the terms: primary producers, pastoral workers, agricultural workers, commercial workers.

2. Name countries in which (a) primary producers and (b) industrial workers form a very large proportion of the working population. Illustrate your answer by colouring an outline map of the world.

3. What is meant by saying that the professional workers have always been the mainspring of progress in both primary production and industries? Refer to Chaps. 21 and 22.

7. LATIN AMERICA

DURING the fifty years that followed the date of the first voyage of Columbus, the Spaniards succeeded in making themselves masters of a large portion of the New World, and without entering into details we may trace the progress of their enterprises.

In 1519 Cortes landed a small force at Vera Cruz, and set out to conquer the empire of Mexico. The country consists mainly of a lofty plateau, bordered by a low unhealthy belt along the shores of the Gulf of Mexico; the capital is far away in the interior, 7,000 ft. above the sea. Within two years Cortes was master of the capital and in possession of much plunder in the shape of gold and silver. He fitted out expeditions to explore the adjoining territory; he discovered the long peninsula of California and led a party through the forests of Central America to Honduras. Another expedition sailed round the Gulf of Mexico and discovered the peninsula of Florida. Thus the southern part of North America and Central America came under Spanish control.

Meanwhile Pizarro was planning a similar enterprise in South America. His objective was the mountain state of Peru, where, he was told, there was much gold. Following the example of Cortes he pushed his way into the country, captured the old capital Cuzco, seized the reigning Inca, and made himself master of the country's wealth. Then he turned his attention to the adjoining lands. One expedition conquered Chile; another crossed the Andes and reached the head waters of the Amazon. Some of the Spaniards sailed down this river to its mouth; they were the first white men to travel through the *selvas*, the most luxuriant forests in the world. This region, however, forming part of Brazil, had been allotted to the Portuguese.

At a later date Spaniards sailed up the River Plate estuary, and discovered the far-stretching grassy plains of Argentina which they called *pampas*. They founded the cities of Buenos Aires on the shores of the estuary, and Asuncion far up the valley of the Paraguay. But Argentina was obviously a farming region, and therefore of minor importance to the sixteenth-century Spaniards. They explored the valleys of the tributaries of the Parana, which led up to the Bolivian plateau, with the object of finding easy routes for the transport of the plunder from Peru. In more recent times, however, Argentina and the adjoining countries Paraguay and Uruguay have formed an important emigration field for Spain, as Brazil has always been for Portugal.

The states named above are now independent republics. But Brazil was under the influence of Portugal, and the rest of South America, together

with Central America, Mexico, Cuba, and other West Indian islands under the influence of Spain, long enough for the language of the parent nations to become that of the new states. This explains the importance of the Spanish language in the commercial world of to-day.

But the population of this region, conveniently described as Latin America, is not wholly or even mainly of white extraction. Indians are in the majority in Mexico; negroes, whose ancestors were imported as slaves in bygone centuries, form the bulk of the population in the West Indies, and they are very numerous in Brazil and the adjoining states. People of Spanish descent are most numerous in Argentina, in which country there are many settlements of recent date—Italian and French as well as Spanish. There are also flourishing Italian and German communities in the south of Brazil.

Latin America is essentially a region of primary producers. Whites, Indians, and negroes are engaged in raising crops, collecting forest products, rearing flocks and herds, or mining, the special nature of their work being dependent upon physical and climatic factors. A comparatively small proportion of the population is engaged in manufacturing processes, chiefly the preparation of primary products for export.

The Selvas. The Amazonian forest, some 2,000,000 square miles in extent, occupies about half of Brazil and parts of Venezuela, Colombia, Ecuador, Peru, and Bolivia. The region is one of very heavy rainfall. The greater portion of the land is so low that rivers overflow their banks and spread for 50 or 60 miles

on each side during the rainy season. Intense heat and abundant moisture maintain the growth of vegetation so dense that communication is very difficult except along the rivers. Consequently the development of the region has hardly begun. The chief commercial product is rubber. This is collected from several kinds of trees, partly by Indians who live in the forest in a savage state, brought in to trading stations along the Amazon, and sent down the river to Para for export. The only town of any size is Manaos on the Negro—not far from the junction of this river with the Amazon. The town is a collecting centre for forest products, and is reached by ocean-going vessels.

The Plantations of Tropical America. Apart from the Selvas, the grassy plains of Venezuela (*llanos*), and the elevated regions in Mexico and the Andes, the whole of tropical America may be described as a “plantation region”; this includes the West Indies, the shorelands of Mexico, Central America, and South America as far as the borders of Argentina. Labour on the plantations is performed mainly by “Indians” or negroes; slavery was not abolished in Brazil until 1888.

The chief products of the plantations are coffee, cacao (cocoa), sugar, tobacco, cotton, and rubber, which are raised in almost every one of the seventeen states of the region and most of the West Indian islands. Some of the crops mentioned are of very great importance in the world’s commerce. Brazil supplies the bulk of the world’s rubber, and Bolivia is second in importance; half of the world’s coffee is grown in the São Paulo province of Brazil, and

Costa Rica produces coffee of superior quality ; sugar from the Demerara district of British Guiana, from Cuba, Jamaica, and Barbados, and "pepper" from



Latin America, showing selvas, plantation, pastoral, and agricultural areas, and the chief outlets.

Cayenne in French Guiana are of special value ; cacao is particularly important in Venezuela, Brazil, Ecuador, and Trinidad, and its cultivation is being greatly extended in Peru, where 200,000 trees have been planted recently. The pineapple receives special

attention in the Bahamas, the banana in Central America and the West Indies, particularly Jamaica, and the orange in Jamaica and Brazil; maté (Paraguay tea), from the leaves of a species of holly, is grown extensively in Brazil as well as Paraguay, but it is in small demand except in South America. Long-staple cotton from the Piura valley (Peru) is exported in considerable quantity to Britain, and even to the United States; it is in great demand for the manufacture of webbing for motor-tyres.

Other commodities of commercial importance are timber (mahogany) and dyewoods from the forests of Central America, exported through Belize, petroleum, silver, and Sisal hemp from Mexico—the last being exported through Sisal in Yucatan—and resins and drugs from the selvas. The mineral wealth of Brazil is very great but little worked. The iron-fields of Minas Geraes are particularly rich, and precious stones, diamonds, emeralds, rubies, and others are found.

To prevent confusion we may notice here that many vegetable fibres are known commercially as “hemp”. True hemp, the inner bark of a plant that belongs to the nettle family, is produced chiefly in Russia, Italy, China, and U.S.A. Sisal hemp or henequen, now grown extensively in Florida, Cuba, the Bahamas, Hawaii, and Kenya Colony, as well as in Yucatan, is obtained from the leaves of a species of agave. Manila hemp, prepared by hand from the leaf-sheaths of a species of banana plant, is grown mainly in the Philippines; like Sisal hemp it requires a warmer and more humid climate than true hemp. All varieties of hemp are used for making ropes and

coarse canvas ; the Manila fibre usually has a " second life " as paper, and true hemp is greatly used as a substitute for flax.

The elevated portions of tropical America, the Mexican plateau, and the high valleys and plateaux of the Andes, differ in climate and crops and to some extent in population, from the lowlands ; the proportion of white people and mestizos (mixed white and Indians) is greater in the highlands. The zones of Mexico, distinguished and named long ago by the Spaniards, are : (1) *tierra caliente* (hot zone), with forests of mahogany and plantations of sugar, rice, cacao, and rubber ; (2) *tierra templada* (temperate zone), with crops of maize, beans, coffee, bananas, and tobacco ; it might therefore be called a sub-tropical zone ; (3) *tierra fria* (cool region), with crops of wheat and barley.

Somewhat similar zones can be distinguished in the Andean states, where, however, the shorelands are not very productive ; the portion in the south-east trades region is desert. The plateaux of Peru and Bolivia provide pasture grounds for large numbers of sheep, llamas, and alpacas, and wool is a feature of the export trade. As Bolivia is a coastless state, goods are exported through one of the Chilean ports, whither they are sent partly by railway and partly by mule or llama caravans, or through the Argentine ports which they reach by the Paraguay. The ports of Latin America are marked in the map on p. 65, which should be compared with physical and political maps.

Two only of the states in tropical America possess manufacturing industries worthy of mention. In 1921

there were 240 cotton mills in Brazil and over 120 in Mexico ; iron and steel works have been started near the iron-field of Minas Geraes (Brazil), and at Monterrey and Apulco (Mexico). The industries are developing, but tropical America is, as yet, essentially a region of primary producers.

Argentina, Paraguay, Uruguay, Chile. South of the tropic of Capricorn, South America consists mainly of Argentina, but between the ridge of the Andes and the Pacific there is the long narrow country of Chile, whilst on the eastern side of Argentina there are the smaller republics Paraguay and Uruguay.

The north-eastern part of this region, including Uruguay, Paraguay, and the Gran Chaco of Argentina, which lie in the track of the south-east trades, and the southern part of Chile, which lies in the track of the west winds, have a moderate annual rainfall. The rest of the region has a dry climate, and the central part of Argentina consists of grassy plains called pampas, stretching from the Atlantic shores to the foot of the Andes ; the Atacama desert in Chile and the shingle desert of Patagonia are rainless.

The Gran Chaco, a region of forest and swamp with a few clearings for agriculture and pastoral work, is peopled mainly by natives ; its only contribution to commerce consists of timber.

Paraguay and Uruguay are to some extent plantation regions, growing tobacco, sugar-cane, maté, as well as fruits of the Mediterranean type. In Argentina, however, the activities of the people have been directed along a different line. The pampas region is a natural pasture-land ; some cattle and horses turned loose there by the early Spaniards multiplied

into vast herds in the course of two centuries. At the present day pastoral work occupies the attention of a large proportion of the people. The numbers of animals fed on the plains are truly enormous. The returns for 1915 include 81 million sheep, a figure approached by that of no other land but Australia (76 millions in 1916). In addition Argentina possesses 30 million cattle, as well as millions of horses and goats. Some of the Argentine ranches are owned by well-known British firms dealing in meat or meat extracts.

“Livestock products,” including meat, meat extracts, wool, and hides, occupy first place in the list of exports, far exceeding in value, during the last few years, all other commodities put together. But the last quarter of a century has seen a steady increase in the amount of land under cultivation, due partly to the extension of irrigation systems, and partly to the influx of large numbers of Italian peasants. The export of agricultural produce, chiefly wheat and linseed, has risen in value to about half that of livestock products. Cereals, flax, grapes, sugar-cane, and tobacco are grown in the north, and in the province of Buenos Aires.

The mineral stores of Argentina are so small as to require no special notice ; and it may be said of the bulk of the workers that they are engaged in stock raising and agriculture or in some industry based on these, such as meat-freezing, wine-making, sugar-refining, all carried on in Buenos Aires and a number of small towns in its neighbourhood.

The central and most thickly peopled part of Argentina is covered with a network of railways.

The Buenos Aires and Pacific (Trans-Andine) line links the capital with Mendoza, the centre of a great fruit-growing area at the base of the Andes, whence it is carried over a pass in the mountains to Valparaiso, the Chilean port. Rosario, the river-port and outlet of the corn-growing area, is connected with the Trans-Andine railway by a line to Mercedes.

Chile, nearly 3,000 miles in length and little more than 100 miles in greatest width, appears on a small-scale physical map to be simply the western slope of the Andes, which rise in the northern part to an altitude of about 20,000 ft. But there is a smaller broken coast range between the Andes and the sea; the bulk of the people live in the middle portion of the depression between the two ranges, and here also is the capital, Santiago.

The northern part of Chile is desert, the southern part is wet and inhospitable. The central part has an excellent climate, and with the aid of irrigation canals it yields crops of wheat, barley, and grapes big enough to allow of export to other South American states. On the borders of the desert there are extensive grazing lands where cattle and merino sheep are reared, though in numbers insignificant compared with those of Argentina.

So far as foreign commerce is concerned, the chief wealth of Chile lies in the nitrate beds of its desert, the working of which engages over 14,000 men. Large quantities of nitrates are exported through Iquique for use as fertilizers, or for the extraction of iodine and bromine. Copper is mined extensively for export, chiefly to Britain, and coal of indifferent quality is worked in the south for export to neighbouring states.

Chile imports a considerable amount of coal from Australia. Valparaiso, the chief port on the Pacific coast of South America, controls practically the whole of the import trade of Chile.

The productions of the principal British colonies within the region of Latin America are summarized below :

British Honduras. The mahogany industry is the most important in the colony.

Jamaica. Fruits—bananas and oranges—sugar, rum, dyewoods. The production of dried bananas is a new and promising industry.

The Bahamas. Sisal hemp, grown by peasants on a large number of islands, sponges, and fruit. Canned pineapple, and tomatoes (raw and canned) are exported.

Trinidad and Tobago. Sugar, cacao, fruits (bananas and citrus), coco-nuts and copra, spices.

Barbados. Sugar, Sea Island cotton.

Leeward Islands. Sea Island cotton.

Windward Islands. Cacao, spices, and limes in Grenada ; Sea Island cotton and arrowroot in St. Vincent.

British Guiana possesses large deposits of bauxite (aluminium ore) now being worked, and some gold, diamonds, and iron-ore. Agricultural products are sugar and coffee.

EXERCISES

1. Read *Central and South America, In the Forests of Brazil* (from *A Naturalist on the Amazons*), and, if possible, Bryce's *South America*.

2. Mention commodities that come under the head of "The South American Trade" in British commercial papers,

and name the states from which such commodities are exported.

3. Show on an outline map of the Atlantic Ocean the chief trade routes between South American, West Indian, and Mexican ports and Europe ; insert the names of commodities carried along each route.

8. THE UNITED STATES

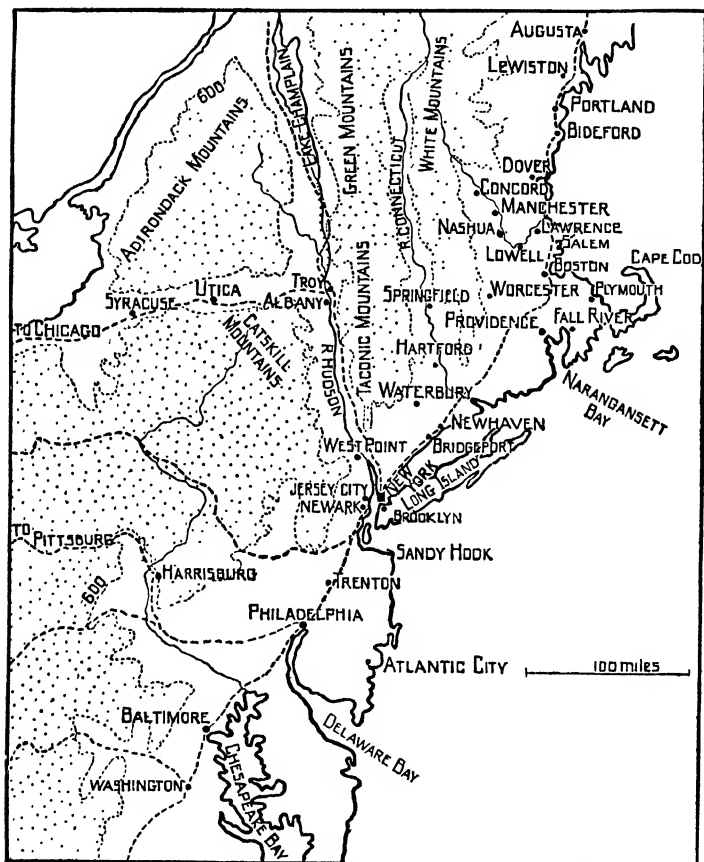
THE settlement and exploration of America north of the Gulf of Mexico began peacefully by the establishment of European colonies on the east coast. A New France was set up in the St. Lawrence valley, and Nova Scotia ; a New England, between the Bay of Fundy and the mouth of the Hudson ; a New Netherlands in the Hudson valley ; a New Sweden along the Delaware ; and another English colony called Virginia around Chesapeake Bay. Eventually the French, Dutch, and Swedish colonies came into the possession of Britain, and the New England colonies separated from the mother country. We will not here trace the steps which led to these results ; most history books give a full account. It is of interest to note, however, that the province of Quebec is still inhabited by French-speaking people.

The British settlements on the Atlantic plain were almost completely shut off from the interior by the Appalachian Highlands. The Mohawk valley, which forms the chief route through the mountains, was held by a warlike Indian tribe, the Mohawks, who sided with the English in the eighteenth-century wars. The French on the other hand had easy access by

the St. Lawrence and Great Lakes to the region behind the Appalachians, and they naturally were first in exploring the interior. They discovered the Mississippi and explored its valley to the sea, leaving traces of their work in such names as New Orleans and Louisiana.

It was not until the nineteenth century that British colonists began to push their way into the interior of the continent. The movement was stimulated by the discovery of gold in the Far West in 1848. Then began what was literally a long procession of gold-seekers, driving wagons loaded with their worldly possessions along the Mohawk trail, and out into the trackless prairies. The westward movement led to the establishment of colonies beyond the Rockies and in the prairies of the Middle West. It led also to the transfer of portions of the continent from the Spaniards to the United States government, and to the definition of the boundaries of the republic. The prairies of the Middle West extend far into Canada, and the absence of a natural barrier made it uncertain where the United States territory ended and Canada began. In 1846 the 49th parallel was adopted as the boundary between the two countries.

The North-eastern Manufacturing and Commercial Region. A few years ago the American ambassador in London described the people of the United States as "yet a rural nation". Having heard so much in recent years about great industrial organizations and "combines" in America, British people generally receive such information with surprise. The statement is, however, supported by statistics. There are $6\frac{1}{2}$ million farms in the country; for every two



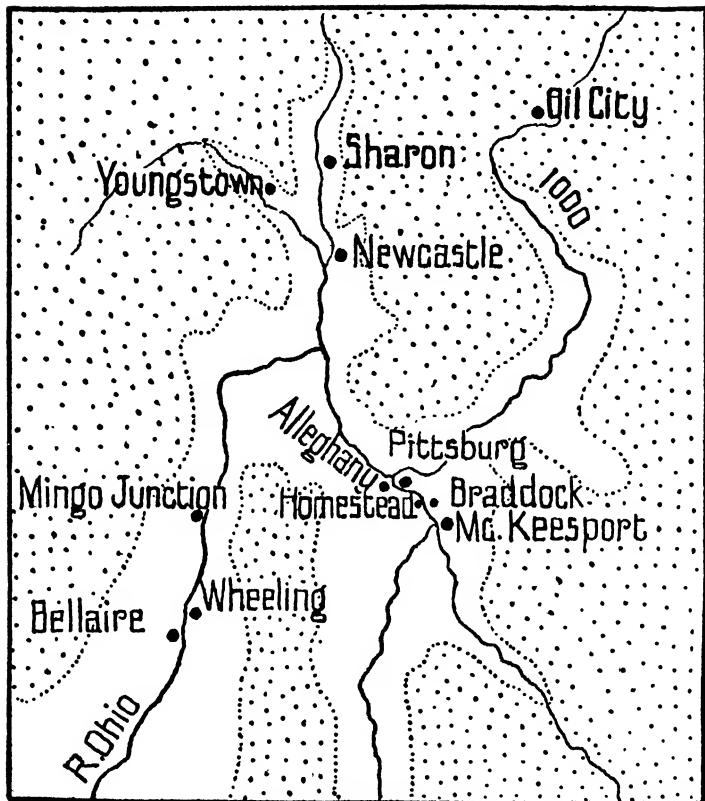
The North-eastern Commercial and Industrial Region of the United States. (Railways shown by broken lines.)

people engaged in manufactures and mechanical pursuits there are three engaged in agriculture ; twice as much capital is invested in agriculture ; the value

of exports of farm products is over twenty times as great as that of iron and steel manufactures. Nevertheless, the use of the word "yet" by the ambassador suggested that he had in mind the rapid development of American industries.

As a matter of fact there is in the United States one of the most highly developed industrial regions in the world; it is the Appalachian coalfield, which extends along the western flanks of the mountains from Pennsylvania to Alabama. Pittsburg at the northern end, and Birmingham at the southern end, are the chief centres of two steel-manufacturing areas. Around Pittsburg there is a large group of towns, Newcastle, Wheeling, South Bethlehem, and others, brought into existence by the same industry; the works are controlled by the United States Steel Corporation, one of the greatest organizations of its kind in the world. The iron-ore that feeds the furnaces comes partly from the Appalachians and partly from the iron-fields that surround the head of Lake Superior.

Kindred industries have developed in certain towns a little distance from the coalfields, but possessed of a good geographical situation. Philadelphia, a port on the Delaware, and connected directly with Pittsburg by a railway through the Susquehanna valley, Syracuse, Troy, and Albany on the Mohawk route, are important engineering centres. Detroit is a famous centre for the building of motor-cars and tractors; the Americans exported over 100,000 motor-cars in 1920. Many lake-side towns trading in ore from the Lake Superior region have become centres for steel manufacture. Amongst these are Cleveland and



Map showing situation of the steel-making towns in the upper part of the basin of the Ohio.

Buffalo on Erie, and Gary on Michigan; the last was built expressly for steel-working.

The chief textile area, drawing fuel from the Appalachian coalfield, cotton from the southern states, and

wool partly from the hilly New England states and partly from Australia and Argentina, lies east of the Connecticut. It includes the important centres Fall River and Providence on Naragansett Bay, a line of towns in the valley of the Merrimac, the chief of which are Lawrence, Lowell, Manchester, and Nashua,

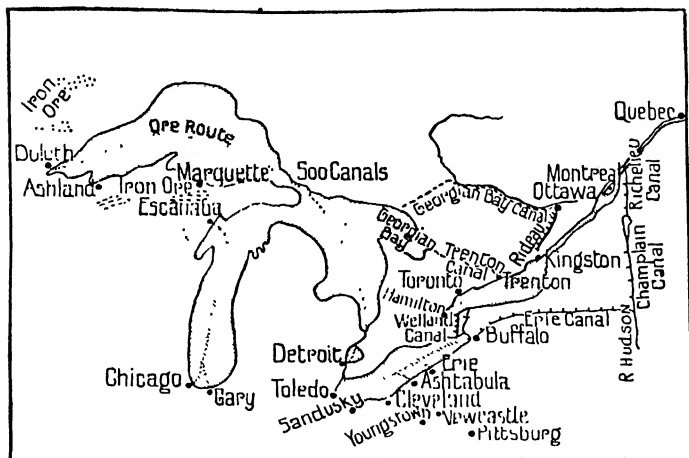
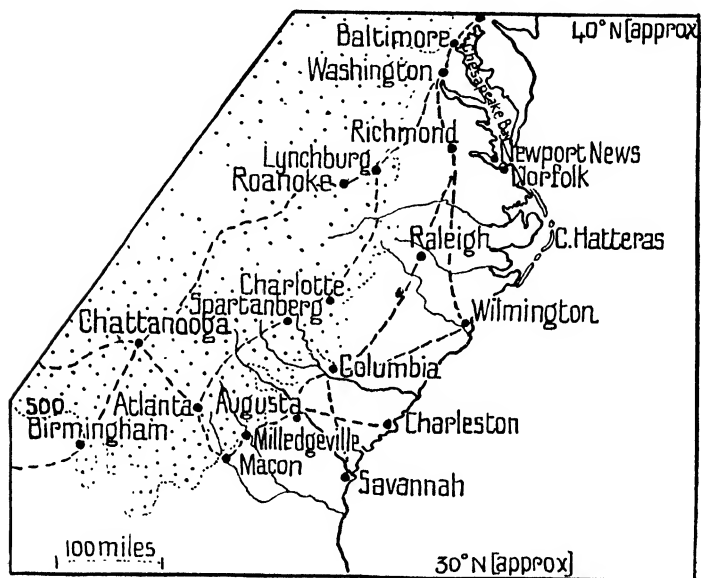


Diagram showing the importance of the Great Lakes for the transport of iron ore. The waterways have been improved and extended by means of canals, and further improvements are contemplated by connecting Ottawa and Trenton with Georgian Bay. From Cleveland ore is sent to Pittsburg by rail.

and Lewiston, Augusta, and some smaller towns in the state of Maine, all engaged in the manufacture of cotton. Providence and Lawrence are also important centres of the woollen industry.

A second textile area, which has steadily increased in importance during recent years, is found farther

south. It includes Richmond, Columbia, Milledgeville, Augusta, and Columbus, all of which are situated in the neighbourhood of the Fall Line—a line of waterfalls formed where rivers descend from the Pied-



The Southern Textile Region of the United States, possessing a humid climate, ample supplies of raw cotton (grown in all parts of the coastal plain), rivers that provide power and means of transport to the sea, supplies of coal and iron in the neighbouring Birmingham coalfield, and good rail connexions with New York.

mont plateau to the coastal plain. Cotton factories have been established in these towns, and they enjoy the advantages of being near the cotton-growing region and within easy reach of the Birmingham coal

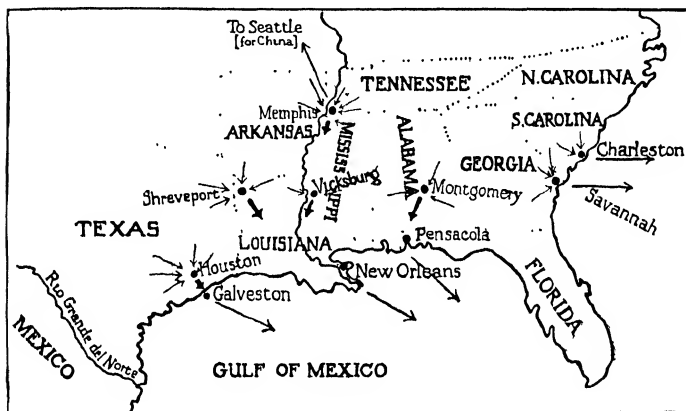
area. Many of the factories are now being worked by hydro-electric power derived from the falls, and all may ultimately be independent of the coalfield.

The over-seas trade of the industrial region and a large share of the commerce of the whole country are controlled by a group of cities in the northern part of the Atlantic plain—New York, Boston, Portland, Baltimore, and Philadelphia; all have steamship connexions with the chief ports in Europe and the other continents. New York is by far the most important, for more than half of the exports and two-thirds of the imports of America pass through its docks. This is due to the combined advantages of an excellent harbour and a good geographical situation with respect to the interior. Baltimore is the special port for the textile area; Philadelphia has a special trade in fruit and sugar with the West Indies, and Baltimore in breadstuffs from the interior.

The South-eastern Plantation Region. The south-eastern plantation region of America includes the Atlantic plain from Virginia southward, the Gulf plain, the lower Mississippi region, and the lower part of the Ohio valley. The cultivation of tobacco was introduced into Virginia in 1616 and has been carried on with great success up to the present day, though Kentucky is now the leading tobacco state, possessing in Louisville the greatest tobacco market in the world.

The remainder of the plantation region, consisting of the states south of the 37th parallel, is devoted mainly to cotton-growing. This region includes Texas, Louisiana, Alabama, Georgia, the Carolinas, Florida—names which seem indissolubly associated with cotton—and several others, Oklahoma, Arkansas, Tennessee,

and Mississippi, not quite so well known. Georgia has the largest production of the famous "Sea Island" cotton. Variety is introduced into the region by plantations of sugar-cane and rice on the shore-lands of the Gulf of Mexico, olive plantations and orange groves in Florida.



Map showing (1) the cotton-growing States of America ; (2) the chief collecting centres for raw cotton, with arrows along transport routes ; (3) the cotton ports.

N.B.—New York is also a cotton port, and a considerable quantity of cotton is sent to Seattle for export to China and Japan.

The cotton plant requires a moderate amount of rainfall in the early part of the season, with several months of hot dry weather leading up to the time of picking ; tobacco requires perhaps a little more moisture. These conditions are unfavourable to white labour, and from the seventeenth century onwards the plantations of south-eastern America have been

worked chiefly by negroes—as slaves until the middle of the nineteenth century. This explains the large proportion of negro population throughout the plantation region ; in South Carolina and Mississippi there are many more negroes than whites.

During recent years the demand for raw cotton for the American textile industry has been steadily increasing ; but a large portion of the crop is still exported. In 1913 the raw cotton exports were valued at £110,000,000. New Orleans, Galveston, and Pensacola are the chief outlets on the Gulf Coast, Savannah, Wilmington, and New York on the Atlantic.

Cotton-seeds, formerly regarded as refuse and burnt or thrown away, are now an important source of vegetable oil. Cotton-seed oil has a great market, being used in the manufacture of soap, candles, margarine, and the oil-cake used for feeding cattle.

Perhaps special reference should be made to Florida, a state which has developed greatly during the last few years, after being for a long period in a comparatively backward condition. Large quantities of citrous fruits, strawberries, tomatoes, and vegetables are grown for export to the north in early spring ; forests of yellow pine and cypress yield lumber, turpentine, and resin, much of which is exported to Europe. One of the chief industries is the manufacture of chemical manures, and in this connexion much phosphate rock is exported through Jacksonville to Britain and Germany for the manufacture of “super-phosphate”.

The Grain-lands of the Middle West. Over 30 million Americans live in the prairie states that lie west of the Appalachian Highlands. Allowing

8 millions to the big cities such as Chicago, St. Louis, Cleveland, and others, there remains a population of over 20 millions of rural or semi-rural type, living in villages and comparatively small towns. Add another 30 millions for the population of the agricultural regions in the west and south-east and the meaning of the ambassadorial statement referred to above becomes very clear.

In 1919 America produced 2,600 million bushels of maize (called "corn" in the States), 1,215 million bushels of oats, 912 million bushels of wheat, and 160 million bushels of barley, and all but a comparatively insignificant fraction of this huge grain crop was raised in the "prairie region" of the Middle West. What these figures mean will be realized on noting that the American wheat crop is equal to the amount consumed in the British Isles in four years. Doubtless the American wheat-lands could produce even greater crops, for the yield per acre in 1919 was only 12.5 bushels compared with 29 bushels in England.

The grain belt lies immediately north of the cotton belt, and extends across the country from the Appalachians to the lower slopes of the Rockies. The wheat-growing region extends northward through Minnesota, and into Canada, but maize is a less hardy plant, and its northern limit may be taken as the line joining Madison and Sioux Falls.

Maize is much more important as human food in both North and South America than it is in Europe; but the American crop is used mainly for feeding swine. This at once suggests that swine must be reared in very large numbers; the returns for 1919

gave the number as 75 millions, whilst sheep and cattle numbered 50 and 44 millions respectively.

Chicago, the capital of the prairie region, has grown from a hamlet to a city of nearly two million people in less than a century. Its rapid growth is due in great measure to the employment provided by an ever-expanding meat-packing industry. It is, however, a great port carrying on extensive trade in wheat and lumber over the Great Lakes, through which it can be reached by ocean-going vessels; in 1919 a start was made in the shipment of goods direct from Chicago to Liverpool. Its position makes the city an important railway centre; proximity to the iron fields of Wisconsin and to the timber and coal worked in Michigan has led to the development of the building of locomotives, railway-carriages, and furniture.

Meat-packing is also an important occupation in Cincinnati on the Ohio, Omaha and Kansas City on the Missouri, and in several smaller towns. The development of the Middle West has been greatly facilitated by the existence of excellent waterways in the Mississippi and its tributaries, and by the absence of those physical features that obstruct the building of railways and roads. The Mississippi basin is now covered with an intricate network of railways linking innumerable small rural towns and villages to the important trading centres. Of the latter St. Louis is chief, controlling three river routes and over twenty railway routes.

The twin cities, Minneapolis and St. Paul, built on the Mississippi just below the Falls of St. Anthony, form the industrial and commercial capital of the

northern part of the grain-lands. Minneapolis leads in industry with its timber trade and huge flour mills, worked by power from the falls; St. Paul in commerce, with a collecting and distributing trade in connexion with the Great Lakes navigation.

The Ranching Region of the Great Plains. Omaha is the last big town in the grain-lands. Westward the land rises steadily and the prairie gradually assumes a steppe-like character; rainfall is deficient and rivers flow in deeply cut valleys. This region, a belt four or five hundred miles wide, extending from the Llano Estacado (staked plains) of Texas for some 2,000 miles northward into the Canadian province of Alberta, is known as the Great Plains; but that is hardly a correct description of rolling country that varies in altitude from 2,500 to 7,000 ft.

The winter is not so severe as might be expected, thanks to the *chinook*, a warm dry wind from the Rockies that licks up the snow of the plains. The region is one of cattle-ranches and sheep-farms, though certain irrigated areas are devoted to crops; in the Dakotas and Montana a large tract called the Bad Lands is not suitable for either agriculture or ranching. Over 20 million sheep are grazed on the Great Plains, and Montana is the chief sheep-rearing state in America.

Most of the cattle and beef exported from New York and Boston comes originally from the Great Plains. Collecting centres for eastward transport are numerous enough in so vast a region, but Cheyenne, with a direct railway route through Omaha to Chicago, is the most important, ranking as one of the world's great cattle-markets.

The Basins and Mining Areas of the Rockies. Beyond the Great Plains lies the elevated region bounded by the Rockies and the Sierra Nevada, and consisting of a number of lofty ridges enclosing lower areas called "basins". Some of the latter, clothed with grass and clumps of evergreens, are commonly described as "parks". Such is Yellowstone Park, a wonderful region of forest and mountain, cañons, waterfalls, and geysers, set apart in 1872 as a National Park. The Great Basin is a dry elevated tract between the Wahsatch and Sierra Nevada mountains, with vegetation characteristic of desert fringes—sagebrush and cactus. Within its borders there are many bitter lakes such as the Salt Lake of Utah and the Big Soda Lake of Nevada, and portions of its surface consist of alkali waste—the beds of lakes which have dried up.

Stock-raising is the chief occupation in the basins, but the whole region is dotted with innumerable workings in gold, silver, lead, iron, and copper, and coal is mined in Montana, Wyoming, and Colorado. Denver in Colorado, and Virginia City in Montana, are head-quarters of the mining industry.

The Reclamation Act passed in 1902 provides for the accumulation of funds for the irrigation of portions of this region. By 1910 about a million acres of territory, including much in the Arizona Desert, had been converted into agricultural land. Idaho City, Salt Lake City, and Ogden are agricultural centres in the north, Santa Fé and Albuquerque in the south.

The Pacific Shorelands : Fruit, Grain, Timber, and Minerals. It was the discovery of gold that drew large numbers of settlers to the Pacific shorelands

about the middle of the nineteenth century, but mining does not form the chief occupation at the present day, though both gold and quicksilver are worked. Many disappointed gold-seekers turned their attention to agriculture and became growers of fruit and wheat. For these crops climatic conditions are very favourable, being similar to those of the Mediterranean region, i.e. warm dry summer, and mild rainy winter. Rainfall, fairly heavy in Washington and Oregon on the seaward side of the Cascades, diminishes considerably—even seriously—towards the south of California. Irrigation works have been carried out in all the three states with excellent results.

The three states together raise nearly 80 million bushels of wheat per year, and a large amount is exported to Europe through San Francisco. In California over 800,000 acres of land are used for commercial fruit-growing; fruit-farms are especially numerous in the valleys of the Sacramento and San Joaquin, and around Los Angeles. Orange groves are a special feature. Plums (prunes), olives, figs, grapes, and other Mediterranean fruits are also grown, and large quantities are dispatched to Chicago and New York, in special cars attached to fast trains; generally, over 10,000 car-loads are sent east during the season.

The Cascades and Sierra Nevadas bear magnificent timber—Douglas fir or Oregon pine, sequoia (Big Tree of California), and other trees—and lumbering is an important occupation in Oregon. Portland (Oregon) is an outlet for timber and wheat, and Seattle on Puget Sound has an export trade in coal from the neighbouring coalfield.

EXERCISES

1. Read *America of the Americans*.
2. In what ways is the development of the American textile industries likely to affect British manufacturers ?
3. On an outline map of the Atlantic Ocean mark the chief trade routes between American ports and Europe ; insert the names of commodities carried along each route.
4. Mark on an outline map of the United States regions which produce large quantities of fruit, grain, timber, and cotton. Insert the chief outlet of each region, and the railway connexions with New York.
5. Write a short essay on cotton-seed oil, referring to its origin, uses, regions where produced, and countries where it is largely used for industrial purposes.
6. The American cities, especially New York, Chicago, and Philadelphia, are famous for " Department Stores ". What are the special features of such commercial enterprises ? Mention similar English " stores ".
7. In 1919-20 the United States exported raw cotton to the value of nearly 1,400 million dollars, and imported 157 million dollars' worth (from Egypt and Peru). Can you give a reason why the chief cotton-growing country in the world should import raw cotton ?
8. In 1919-20, one-eighth (by value) of the imports of the United States came from Cuba, and one-tenth from Canada. Make out lists of the goods you would expect the Americans to import from these countries.

9. THE DOMINION OF CANADA AND NEWFOUNDLAND

Eastern Canada (Old Canada). Old Canada is a name that has been given to those eastern provinces of the Dominion—Nova Scotia, New Brunswick, Prince Edward Island, Quebec, and Ontario—in which French and British colonies were established

during the seventeenth and eighteenth centuries. For convenience the term may be used as including Newfoundland, which does not, however, form part of the Dominion of Canada ; but an English settlement was formed in the island so early as 1600.

Old Canada was originally a densely wooded region, and there are still forests in the northern parts of Quebec and Ontario so vast in extent and so difficult to traverse that they have not even been surveyed. In the autumn of 1920 a beginning was made with what is expected to prove a very successful method of surveying, and that is by aerial photography. Photographs taken from aeroplanes in the St. Maurice valley, Quebec, show the chief geographical features, and a variation in tone due to differences in colour of the foliage, forms a guide as to the type of timber.

The pioneers in Old Canada must have had a difficult task in clearing the land about their settlements. Patches of old forest remain in some places, but generally speaking Nova Scotia, New Brunswick, Prince Edward Island, and those parts of Quebec and Ontario within 100 miles of the St. Lawrence or the shores of the Great Lakes, have been converted into agricultural lands. First amongst cereal crops is oats, followed by wheat and barley, and there is some surplus for export. More important in commerce, however, is fruit, especially the apple, which was introduced by early French colonists. Large quantities of English fruits are raised in every province, most perhaps in Ontario and Nova Scotia ; from the latter there is a yearly average of half a million barrels of apples sent to Great Britain.

Dairy-farming is a very important occupation in Ontario and Quebec, where there are several thousand factories—2,000 in Quebec alone—conducted on the co-operative system. Dairy farms and grazing farms are also numerous in Prince Edward Island and Nova Scotia, but in these provinces, as well as in New Brunswick and Newfoundland, a large proportion of the people are engaged in the fishing industry, either on the sea in actual fishing, or on land in canning factories; in the case of Newfoundland, fishermen form more than a quarter of the total population.

The Banks of Newfoundland form one of the world's great fishing grounds, with inexhaustible stocks of cod. St. John's, the capital of Newfoundland, and Halifax, the capital of Nova Scotia, have great trade in dried cod, cod-liver oil, canned lobster, pickled herrings, and other fish.

The fur trade of Canada has been in existence ever since the Hudson Bay Company started operations in 1670. Every spring white and Indian trappers bring loads of pelts from the northern forests and sell them to traders. The chief market in Canada is Montreal, where an auction sale of furs in March 1920 realized £1,000,000. Recent developments in Prince Edward Island may possibly have a great effect upon the old-established occupation of hunting and trapping. There are now fur-farms in all parts of the island, established for the rearing of valuable breeds of foxes. The industry languished somewhat during the European War, but in 1919 the profits approached £500,000. The big returns were due largely to the export of fox pups—1,500 altogether—to Michigan, Japan, Norway, and other places; but in the interests

of their own farms, owners are now restricting exports of live animals.

Lumbering is an important occupation in Old Canada generally, and it takes first place at present in New Brunswick, the chief port of which, St. John, has a very big export trade in timber—spruce, cedar, birch, and oak. Lumbering became an important occupation in Quebec early in the nineteenth century, when large numbers of Irishmen were entering the country. The city of Quebec was for a long time the head-quarters of the trade, but the development of the industry led to the establishment of another big centre at Ottawa, with power from the Chaudiere and Rideau Falls.

Timber has been cut recklessly, much has been destroyed by fires, and the governments of the provinces, realizing that though present stores are great they are not inexhaustible, have lately given attention to planting. In Ontario a large area called Algonquin National Park is being kept as a reserve; it contains much valuable timber.

The first Canadian paper-mill was started in 1865, fed by imported rags. A few years later it was discovered that wood-pulp could be used for the manufacture of paper, and a great new industry was started. Pulp- and paper-mills, controlled by the Riordon Company, the Canadian Export Company, the Spanish River Company, the Anglo-Newfoundland Development Company, and others, are working in various parts of Ontario, Quebec, and Newfoundland.

Since 1904 the Anglo-Newfoundland Company has built a model town—Grand Falls, on the Exploits River—laid a railway from Grand Falls to the port

of Botwood, constructed a concrete dam across the river, built a power house to supply works and homes with electricity, and erected pulping-mills and paper-mills, which produce 50,000 tons of paper a year.

The great wheat-lands of Canada lie to the west of Winnipeg, but owing to the cheap power available much of the milling is done in Ontario and Quebec ; almost every waterfall in these provinces has a flour-mill beside it. Amongst the chief milling centres are Keewatin and Kenora near the Lake of the Woods, Fort William on Lake Superior, Port Colborne, with Canada's biggest mill, worked by energy from Niagara, Toronto, and Montreal. The last of these has the greatest output—about 12,000 barrels of flour daily.

Old Canada has valuable stores of minerals, not yet fully worked, though the output has been greatly increased during the last twenty years. The Sudbury district of Ontario, north of Lake Huron, is particularly rich in nickel and copper, and the Cobalt district, farther north still, in cobalt, silver, and arsenic; there are gold deposits a hundred miles northwest of Cobalt. Quebec produces about 80 per cent. of the world's supply of asbestos, and coal, worked in Cape Breton (Nova Scotia), is exported from Sydney and Glace Bay.

Until quite recent times the people of Eastern Canada were almost wholly devoted to primary production and the industries mentioned above. Industries connected with foodstuffs are still the most important, but there is now a large number of workers in iron and steel, textiles, and other trades.

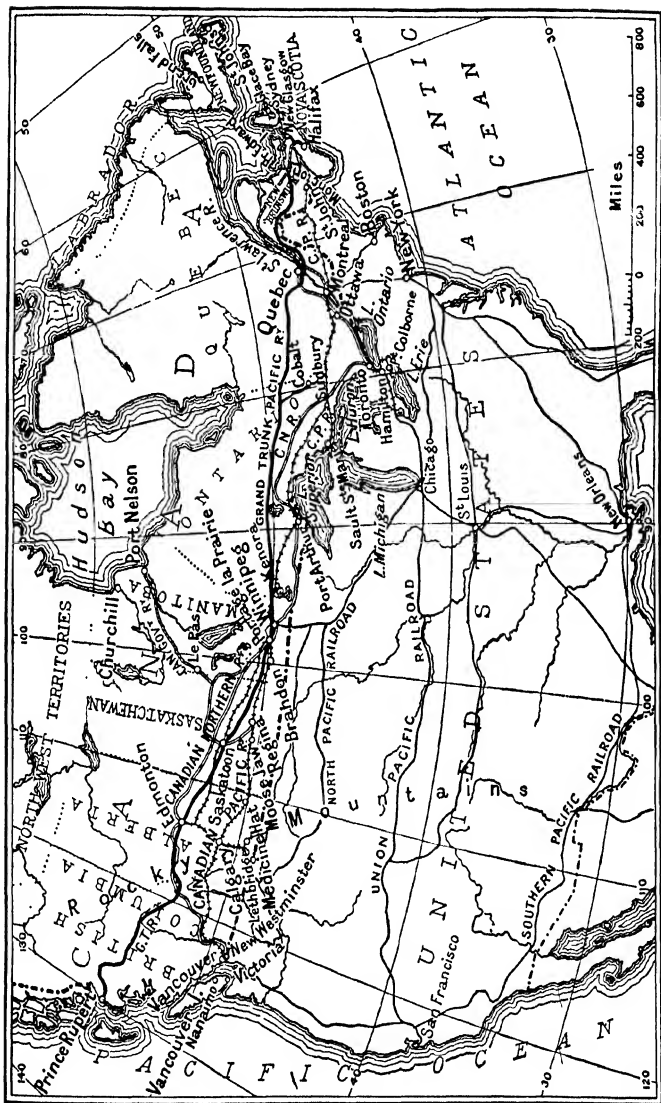
Eastern Canada, with large stores of coal and metallic ores, and with enormous supplies of water

power, may well become a manufacturing region of great consequence. In Ontario there are four large industrial centres, viz. Toronto, with iron foundries, shipbuilding yards, railway workshops, and machine shops; Hamilton, possessing iron and steel works, machine shops, and boot factories; Trenton, producing chemical fertilizers and dye-stuffs; London, with factories for the manufacture of boots and shoes, and agricultural machinery. In addition, iron-smelting is carried on at Deseronto, Sault Ste Marie, and Port Arthur.

The great water-power resources of Quebec are utilized for similar industries at Montreal, Shawinigan, and Valleyfield, and at Sherbrooke there are factories for the manufacture of cotton and wool.

Farther east, in the coal-producing region of Nova Scotia, there are several iron and steel centres—Sydney, with large works belonging to the Dominion Iron and Steel Company, New Glasgow, and Londonderry. Another centre is Moncton in New Brunswick, where there are railway workshops and boiler works.

The Grainlands and Ranches of Central Canada. The prairies of Canada form a region that rises gradually from an altitude of 500 ft. in the east to over 4,000 ft. in the west. In the south it is divided into three steppes by two escarpments, shown on an exaggerated scale in the diagram; the escarpments do not coincide with the boundaries of the provinces. Being in the heart of the continent, Central Canada is a region with extreme climate and low rainfall. The white man found it almost entirely free from forest, and clothed with the long grass characteristic of steppe-lands.



Stanford's Geographical Estate, London

Principal Railway Systems of Canada and the United States.

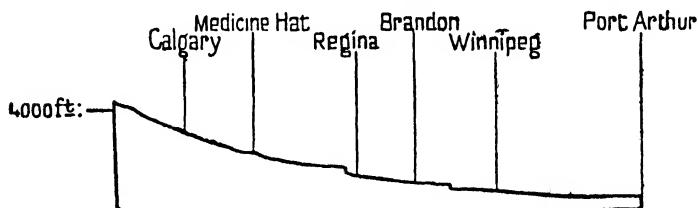
Such a region would have presented fewer difficulties to early settlers than did Eastern Canada. But the founding of settlements is not governed only by the nature of the country ; means of communication with the mother country and with other settlements are of greater moment to pioneers than unencumbered land. Thus the rich prairie-land, remote from the Atlantic, and shut off from the Pacific by the Rocky Mountains, remained almost unoccupied by white men until the latter part of the nineteenth century.

The country was known to the hunters and trappers of the Hudson Bay Company, who traversed the deep trails made in the prairies by countless herds of buffalo. The Company had a trading-station at Fort Garry (Winnipeg), but the first colony, established near Fort Garry in 1812, consisted of a number of Scottish people who had been driven from their farms in the Highlands. They settled in the valley of the Red River, which has been described as one of the most fertile regions in the world, and were the forerunners of the big army of agricultural workers that advanced into Central Canada.

The big army did not follow immediately ; its advance began in the last decade of the nineteenth century, when Port Arthur, the terminus of the Great Lakes waterway, had been linked to Winnipeg by railway. The opening of this route, combined with the offer of free prairie farms, led to a great influx of settlers from Old Canada, the United States, Britain, and other countries. The completion of the Canadian Pacific Railway in 1886, and of the Canadian National and Grand Trunk later on, encouraged settlement right away up to the Rockies. Settlements

were made chiefly along the railway routes, and the biggest trading centres, Winnipeg, Portage la Prairie, and Brandon in Manitoba, Regina, Moose Jaw, and Saskatoon in Saskatchewan, Calgary, Edmonton, and Lethbridge in Alberta, naturally developed where several railways converged (see page 97).

During the first ten years of the present century the tide of settlement in the prairie provinces reached high-water mark. The acreage under cultivation in Saskatchewan increased from 650,000 in 1901 to



Diagrammatic section across Central Canada. The region consists of three steppes separated by escarpments, the height of which is exaggerated in the diagram. The first escarpment is of cretaceous rocks, and the second of tertiary rocks.

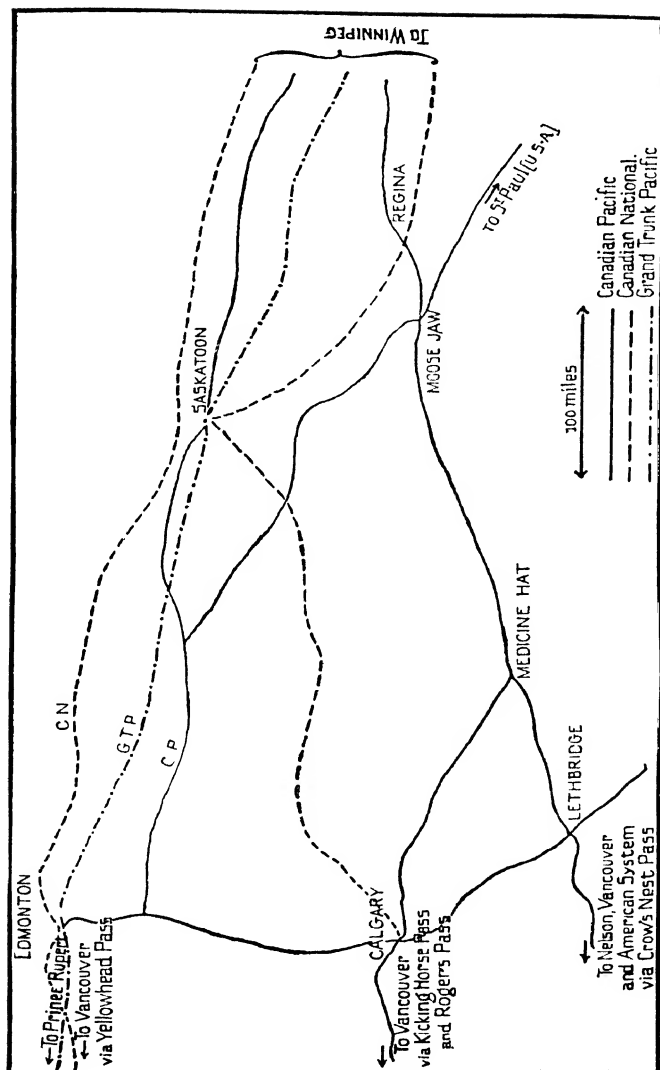
nearly 8,000,000 in 1911, and in Alberta from 190,000 to 2,000,000. During the same period the population of these two provinces increased from 164,000 to 867,000; Saskatoon, a village of 113 people in 1901, was a town of 12,000 in 1911. The increases in Manitoba, though not quite so striking, were very considerable.

Central Canada passed through a stage common to newly-settled countries. The "boom" in colonization led to a boom in land values, especially in the towns, and during the period 1910-13 prices reached

an extraordinary level. Then came the "slump", hastened by the European War; sites which were selling at £1,000 in 1913 could be bought for £100 or £150 in 1919. Prices are now approaching the normal, that is, the earning value of the land.

There are very large stores of coal in Alberta, worked chiefly around Lethbridge to the extent of about 6,000,000 tons annually, and copper deposits in Manitoba, near the new railway from Le Pas to Port Nelson, which have been worked for several years; but the prairie provinces are occupied by a population which is almost wholly devoted to farming and the associated industries. Grain-growing, ranching, and dairy-farming are carried on to some extent in each province; but whilst agriculture predominates in Manitoba and ranching in the dry province of Alberta, the two branches are of about equal importance in Saskatchewan. Agriculture is, however, continually encroaching on the ranch lands of Alberta, where both "dry-farming" and irrigation have been resorted to for the purpose of raising grain, sugar-beet, and other crops, and the ranchers are retreating into the Rockies. The change is reflected in the history of the trade of Medicine Hat, a town of some 10,000 people near the eastern border of Alberta, well known as a ranching centre only a few years ago. At present Medicine Hat ranks fifth amongst Canadian flour-milling towns; the machinery is driven by "natural gas".

The co-operative system has become firmly established in Central Canada. Early in the present century grain-growers' associations were formed in each province, and in 1916 those of Alberta and



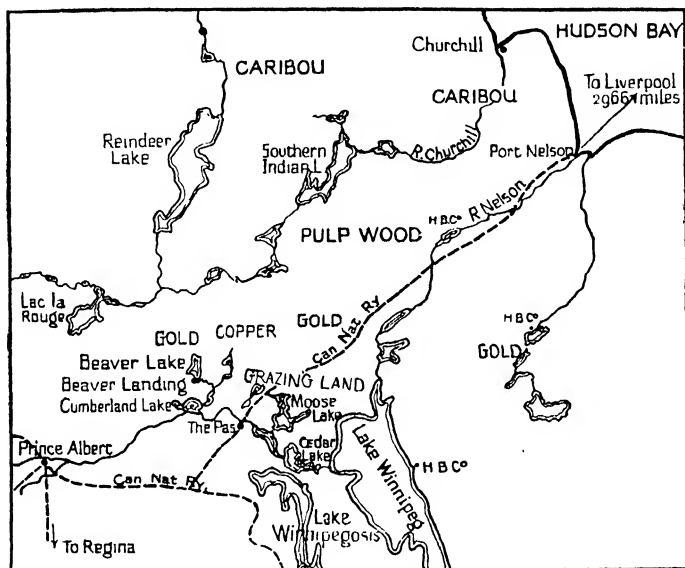
Scheme of Railways in Central Canada.

Manitoba were amalgamated as the United Grain Growers, Limited. This company, which is concerned with the sale of farms, grain, and farm machinery, controls 350 grain elevators in the prairie provinces, and has offices in all the important towns between Fort William and Vancouver.

In 1912 the 60th parallel was adopted as the northern boundary of Manitoba, Saskatchewan, and Alberta ; thus a large area of forested land, previously part of North-west Territories and almost uninhabited, was added to each province. To the people of the grain-lands the new territory is valuable because of its wealth of timber and minerals. Gold and copper are being worked to the north and north-west of Lake Winnipeg, chiefly in the Beaver Lake Mining District. A proposal has been made to convert the northern portion into ranches for the rearing of caribou and musk-oxen, with a view to supplying European markets with meat said to be equal in quality to beef, as well as with hides from the caribou and wool from the musk-ox. The scheme is strongly supported by Stefansson, the Arctic explorer, who declares that a large portion of Northern Canada is very suitable for white settlers, though arable farming is out of the question. The North American Reindeer Company, with head-quarters at Le Pas, came into existence in November 1919, and proceeded during the following year to put the scheme into operation.

Another result of the shifting of the northern boundary is that Manitoba has obtained a coast-line and the ports Churchill and Nelson in Hudson Bay. Port Nelson is nearer to Liverpool than is Montreal, but it suffers from the fact that Hudson Strait is

blocked with ice during more than half the year, whilst icebergs and fogs make the passage dangerous during the open period. Montreal, with similar disadvantages, has nevertheless become a great port.



New Manitoba and part of New Saskatchewan, showing the newly opened mining area, and the route from The Pas to Hudson Bay.

and attempts are being made to find a safe course into Hudson Bay. If these are successful Port Nelson will become the outlet for the produce of Central Canada. With this in view a railway is being built from the Canadian northern terminus at Le Pas, along the Nelson valley to Port Nelson.

British Columbia. Mines, Fisheries, Fruit-farms, Forests. British Columbia, traversed by the Rockies, Selkirks, Gold Range, Cascades or Coast Range, and other high ridges, is a very mountainous region, the central and northern parts of which have not been surveyed in detail except along the railway routes. The seaward slopes of the mountains receive abundant rainfall from the westerly winds, but between the Cascades and the Selkirks there is a well-marked "Dry Belt". With the exception of this belt the country is generally well forested, the Douglas fir being a conspicuous and very valuable tree.

In forests, mines, rivers, and fertile valleys British Columbia possesses enormous wealth. White population was first attracted to the country by the discovery of gold in 1854, and since that time mining has been the most important occupation. In addition to gold, there are stores of silver, copper, lead, zinc, and coal. The last of these is worked chiefly in the Elk River and Crow's Nest areas and in Vancouver Island, and most of the coal is sent into the United States; Nanaimo is the outlet for Vancouver coal.

Next in importance to mining comes lumbering in the forests of Douglas fir, pine, larch, oak, and maple. The development of Central Canada led to a great demand for timber, met largely by British Columbia. In addition there is a great export trade through Vancouver and New Westminster with China, Japan, South America, and Australia.

The fishing industry has made great progress in recent years, a large number of the people engaged being Chinese or Indians. Prince Rupert is the centre of an important halibut fishery, and from this port

large quantities of fish are dispatched in special cars by the Grand Trunk Railway to Montreal, Boston, and New York. Equally important are the salmon fisheries of the Fraser and other rivers. There are nearly 100 fish-canning factories on the coast, one of the chief centres being New Westminster.

Transport difficulties have rather interfered with the development of agriculture and pastoral work; but wheat, oats, potatoes, and other crops are raised in the valleys and on Vancouver Island, chiefly to satisfy the home demand, and dairy-farming is carried on in Vancouver Island and Victoria. Fruit-growing has received special attention in the south, particularly in the Okanagan Valley—in the Dry Belt. Apples, grapes, apricots, peaches, plums, and other fruits are grown in considerable quantities, and some are exported to Europe.

Yukon, a territory that extends from the northern boundary of British Columbia to the Arctic Ocean, has a population of about 8,000. The workers are engaged mainly in placer gold digging. Communication between Dawson (the capital) and Vancouver has been established via the Yukon river to Whitehorse, whence there is rail connexion with Skagway on the Pacific coast.

EXERCISES

1. Read *Canada* (Home University Library).
2. On an outline map of Canada mark areas devoted to agriculture, dairy-farming, ranching, fruit-growing, lumbering, fur-production, and mining. Show the situation of collecting centres and ports.
3. Make out a list of the exports from each of the provinces of Canada.

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4. Give in rough outline an account of a year's work of a Saskatchewan farmer, emphasizing points in which it differs from that of an English farmer.

5. On the outline map used for Exercise 2, mark the course of the trans-continental railways of Canada, and mark the situation of the chief towns. Show by dotted lines where new railways may be built.

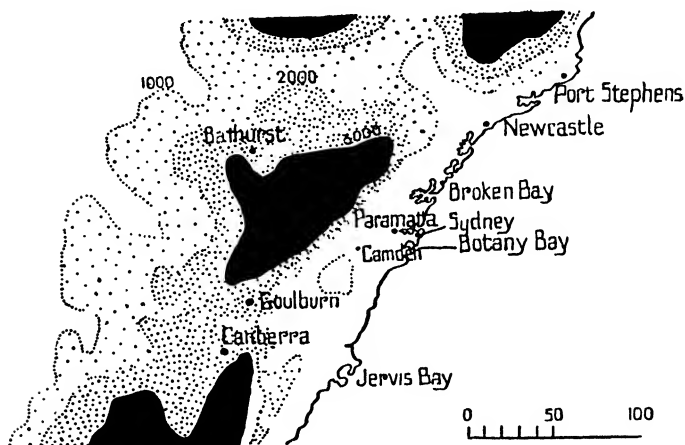
6. Name the chief industrial centres in Canada, and say what advantages they possess as regards raw material, power, and means of transport.

10. AUSTRALIA

THE island continent of Australia, the existence of which was hinted at by ancient Greek geographers, received no white settlers until near the end of the eighteenth century. Dutch seamen were the first to give serious attention to the great southern continent; but though they named it New Holland, they did not enter into and possess the land. This is hardly a matter for surprise, considering that they discovered the most inhospitable portion of the continent. The portion of the coast-line explored by the Dutch is marked by such names as Groote Eylandt, and Van Diemen Gulf in the north, Dirk Hartog Island and Cape Leeuwin in the west, and Nuyt's Archipelago in the south.

Over a hundred years later, Captain James Cook, approaching the continent from New Zealand, struck the east coast near Botany Bay, and found a region of quite a different kind. He gave it the name New South Wales. About seventeen years later still, in 1788, the settlement and exploration of Australia really began, the first step being the planting of

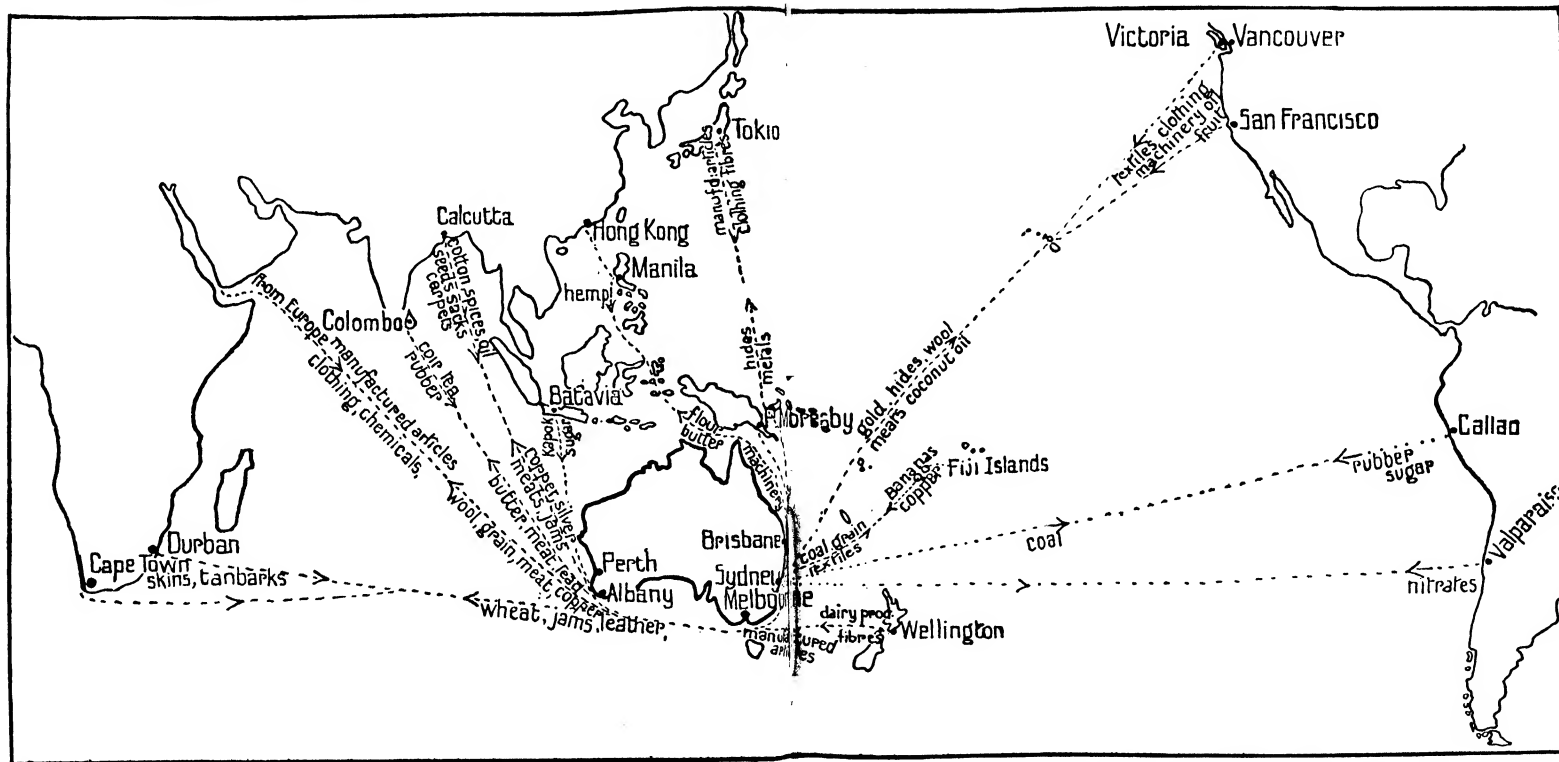
a colony of English convicts in New South Wales. That may not seem to be a very promising beginning, but it should be remembered that in those days men were often "transported" for poaching and other offences which are not now regarded as very heinous; most of the convicts actually made first-rate colonists.



New South Wales.

The settlement was established on the shores of Sydney Cove (now Port Jackson), and when formally proclaimed a colony on the 7th February 1788, the population was 1,024. Wheat, barley, and grapevines were planted during the first season; sheep were introduced without delay, and thus began that branch of pastoral work for which Australia has always been famous. The first large sheep farm was

established at Camden in 1805, and the first shipment of wool to England was made in 1807.



Map showing the favourable situation of Australia for trading with lands around the Pacific and Indian Oceans. Australian trade with South-eastern Asia and the East Indies has increased by 600 per cent. since the beginning of the century.

The build of Australia is somewhat remarkable. The continental water-parting, named in different parts the Great Dividing Range, Liverpool Range, Blue Mountains, and Australian Alps, lies quite near

to the east coast. It recedes somewhat in New South Wales, leaving between the Blue Mountains and the

coast a stretch of low land some 50 miles wide, that formed the domain of the first English settlers.

The most extensive area of low altitude lies immediately to the west of the great watershed, and it is

divided into two parts, basin-like in form, by the Flinders and Grey Ranges. One of these parts is the basin of the Murray-Darling, described as Riverina in the east; the other is an inland drainage basin containing lakes and rivers which shrink or disappear altogether during dry seasons.

Beyond the Lake Eyre basin there is the plateau that practically fills the western half of the continent. Within the shoreland belt of low land the altitude is everywhere over 600 ft., and a large area in the interior is over 1,500 ft. above the sea. This region includes the Great Sandy Desert, Gibson Desert, and the Great Victoria Desert.

The Eastern States. For over twenty years settlements were confined to the coastal region between the Blue Mountains and the sea, but during that period the highlands were being explored. A route over the mountains to the valley in which Bathurst now stands was discovered in 1813; four years later another way to the Riverina, via Goulburn Plains, was explored.

The low land beyond the mountains was found to be a vast grass-land region, admirably adapted to sheep-farming, except that there was a shortage of water. This deficiency has been to some extent made good by the construction of a large number of artesian wells. A new world, practically unpeopled, lay before the settlers; they entered into possession, and thus began the era of the Australian "squatter".

Squatters simply took possession of large tracts of land, built their homesteads, and stocked their farms with sheep. In the old days there were "runs" on which the sheep numbered hundreds of thousands;

some were overstocked. Farms with from fifty to a hundred thousand are not uncommon at the present time, but the day of the squatter has almost gone.

The conditions began to change with the discovery of gold in each of the Australian colonies during the latter half of the nineteenth century. Fresh discoveries have been made from time to time, the most recent being one at Poseidon (Victoria) in 1906, and another at Lassogowrie (West Australia) in 1920. Each discovery led to a large influx of population ; this brought a greatly increased demand for farm produce, and an extension of agricultural land. Many a squatter had to give up his holding, receiving a sum of money as compensation, and move farther into the interior where the conditions were unfavourable to agriculture. In many cases a squatter's holding has been converted into from two to three hundred farms.

From New South Wales exploration proceeded northwards into Queensland, and southwards into Victoria. At the present day these three eastern states, with 35 per cent. of the area of Australia, contain over 80 per cent. of the population. Until recently they were almost entirely devoted to primary production, a position they still occupy so far as external trade is concerned. But a considerable proportion of the population is concentrated in towns, where of course primary production is limited in scope, and there has been a steady, if slow, development of industries during the last quarter of a century. Industrial activity was stimulated during the European War ; for example, works for the manufacture of iron and steel on a large scale were started at Newcastle in 1915.

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Coal and iron, which are well distributed throughout the continent, are most worked in New South Wales, much coal being exported from Newcastle to New Zealand and other parts of Australasia, South-eastern Asia, and San Francisco.

Naturally enough, industrial activity is directed towards the utilization of home products—wool, hides, tan-barks, iron, &c.—and so far the manufactured articles have been almost entirely disposed of in the home markets.

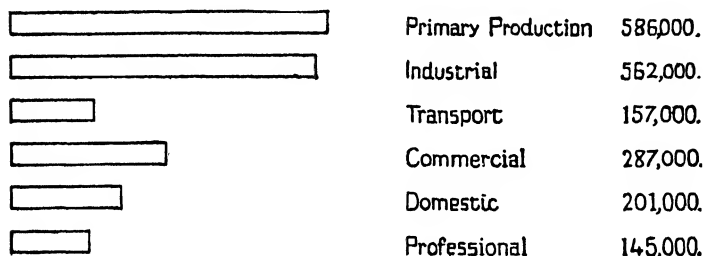


Diagram showing the proportion of the working population of Australia engaged in the six groups of occupations.

Amongst the industrial centres are: Melbourne (textiles and engineering), Ballarat (iron works and locomotive shops), Geelong (textiles, tanning, paper), Sydney (shipbuilding and engineering), Newcastle and Lithgow (steel works), Ipswich (textiles), Townsville (soap works).

It is to be expected that further development will take place, but at present the Commonwealth Government apparently desires to encourage primary production.

The export trade of the eastern states consists

mainly of agricultural, pastoral, and dairy produce, and minerals, the chief commodities being wool, meat, butter, wheat, and flour, followed by metals, timber, and fruit (fresh, dried, and preserved).

Queensland is a vast country, nearly twelve times as large as England and Wales, and nearly half of its area is within the tropics. Mountains line the

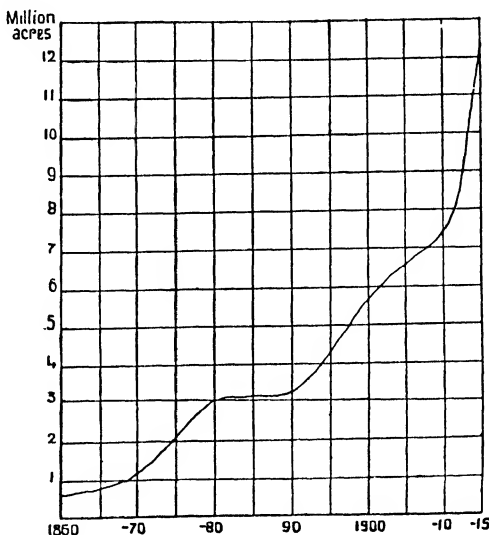


Diagram showing rate at which land has been brought under wheat in Australia.

coast for hundreds of miles ; several long spurs extend into the interior, and their grassy slopes provide extensive feeding grounds for huge numbers of sheep and cattle.

The hot climate of Northern Queensland and the heavy rains brought by the monsoon foster the

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growth of forests, which yield valuable fancy woods such as "silky oak", black walnut, cedar, and sandalwood.

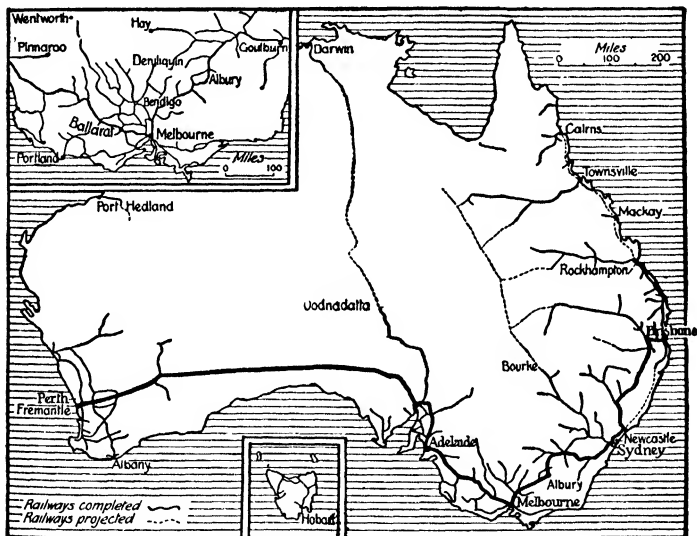
The staple products of the state are wool, meat, and butter, but the northern portion is essentially a "plantation region", where cotton, sugar-cane, coffee, bananas, and coco-nuts are grown. This has brought to the front the question as to whether white people can work successfully under tropical conditions. An Institute of Tropical Medicine was established at Townsville in 1910, and the staff are engaged in researches in diseases, such as malaria, which prevail in North Queensland.

All the eastern states grow large quantities of grain. Queensland leads in respect of maize, New South Wales in wheat, and Victoria in oats. Fruit is grown extensively in each state, but whilst Queensland has many tropical fruits, those of New South Wales are mainly of the Mediterranean type; there is a particularly rich fruit-growing area around Paramatta. Victoria, however, is the chief fruit-growing state in the east, and it has the largest output of jam and preserved fruit. Of the 124 million pounds of these commodities manufactured in Australia in 1916, over 40 millions were made in Victoria, 35 millions in New South Wales, and 7 millions in Queensland.

The importance of Australia as a sheep-rearing land has already been mentioned. Eighty-five per cent. of the Australian sheep are in the eastern states, and more than half of these are in New South Wales. Most of the wool produced is exported, chiefly to Britain (40 to 60 per cent.), the industrial lands of Europe, and the United States; between 3 and 4

per cent. of the total clip is used in Australian woollen mills.

Though the eastern states are so famous as sheep-rearing lands, each possesses also large herds of cattle, raised partly for dairy work and partly for the meat market. It has been found that the finest beef-



Railways and Towns of Australia.

producing cattle are those raised in the tropical parts of Australia—in North Queensland and Northern Territory—and it is interesting to note that the ratio of dairy cows to total cattle increases from north to south in the eastern states. In the year 1916 the ratio was 1 : 14 in Queensland, 1 : 4 in New South Wales, and 1 : 3 in Victoria.

From these facts it is possible to obtain a good

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idea of the nature of the industries dependent upon pastoral work. Whilst all the eastern states export both frozen meat and dairy produce, Queensland leads in the former department, having in its factories more than half of the total meat-preserving workers in the continent. On the other hand, New South Wales and Victoria produce enormous quantities of butter, cheese, and condensed milk. Generally, these commodities are manufactured on the co-operative system ; in 1916 there were 190 factories in Victoria, 167 in New South Wales, and 122 in Queensland.

The Central Belt. In the year 1838 a party of "overlanders" left Sydney, and, driving their cattle before them, travelled along the Murray valley to Adelaide, where a small settlement had already been established. One of the overlanders was Eyre, after whom the large salt lake in South Australia is named. Hoping to find better land in the interior, he followed the line of highlands northwards, to discover only that the interior was a region of salt lakes and desert.

South Australia and Northern Territory together form the central belt of the continent, with settlements only near the north and south coasts. The settled areas are separated by an enormous tract, 340 million acres in extent, occupied only by small groups of aborigines. It has been described as a "heart-breaking wilderness", and it was the scene of many a terrible struggle by explorers about the middle of the nineteenth century.

In the coastal regions the conditions are much better. Agriculture has made little progress in Northern Territory, but there are well-grassed runs stocked with sheep and cattle. A large sum of money

has been spent in the erection of meat-freezing and canning factories at Darwin, and work was started there in 1917. This may be regarded as the most important industry in Northern Territory, though there are several gold and tin mines.

South Australia is, however, the more important colony ; it was started on the road to prosperity by the discovery of rich deposits of copper in 1845. The capital, Adelaide, stands a few miles from the shores of the Gulf of St. Vincent, in a rich agricultural region. Much of the land is used for wheat, but a considerable area is devoted to the growing of grapes for the support of a flourishing wine-making industry. Behind the city there is a range of forested hills which, stretching northward under the name Flinders Range, forms one side of the great depression in which lie the lakes Torrens and Gairdner ; the western border of the depression is the edge of the Great Tableland. Towards the north the vegetation of the hill-country gradually becomes poorer, finally giving place to the scrub of the desert around Lake Eyre ; but it provides pasture for large flocks of sheep.

From Port Augusta a railway has been carried between lakes Torrens and Gairdner and then through the practically unoccupied region north of the Great Australian Bight, to Kalgoorlie and Perth. Northward there is a line west of Lake Eyre, connecting Port Augusta with Oodnadatta, over 1,000 miles in length. Ultimately this line will be continued to Katherine River, the terminus of the line from Darwin, and so form a second trans-continental railway, which will, it is said, bring London within seventeen days' journey of Adelaide.

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Though the five capitals are now connected by railway, the lines are not, unfortunately, uniform in gauge. The table below (from the *Official Year Book*) gives details of a journey from Brisbane to Perth.

<i>Gauge of line. ft. in.</i>	<i>Terminal or changing station.</i>	<i>Times.</i>		<i>Day on journey.</i>
		<i>arr.</i>	<i>dep.</i>	
	Brisbane	—	8.5 a.m.	Monday
3 6	Wallangarra	5.55 p.m.	6.17 p.m.	"
4 8½	Sydney	11.25 a.m.	7.25 p.m.	Tuesday
4 8½	Albury	7.23 a.m.	7.47 a.m.	Wednesday
5 3	Melbourne	12.51 p.m.	4.30 p.m.	"
5 3	Adelaide	9.55 a.m.	10.45 a.m.	Thursday
5 3	Terowie	3.36 p.m.	4.0 p.m.	"
3 6	Port Augusta	9.55 p.m.	10.30 p.m.	"
4 8½	Kalgoorlie	10.20 a.m.	5.40 p.m.	Saturday
3 6	Perth	9.45 a.m.	—	Sunday

Western Australia. Western Australia consists largely of a desert tableland, much of which is imperfectly known; but the borders of the deserts provide pasture land of varying quality. In spite of its vast extent of desert, Western Australia has extensive areas of forest in the lower coastal region, which yield valuable timber (jarrah), tan-barks, and eucalyptus oil.

But the great industry of Western Australia is gold-working, the chief centres of a region crowded with small mining towns being Kalgoorlie and Coolgardie. The discovery of the precious metal in 1893 led to a great rush of workers, and in each year since 1897 Western Australia has held first place in gold-raising—generally producing as much as all the other colonies together.

The chief gold-workings are about 400 miles from the coast, over 1,000 ft. above sea-level, and in a region where water is particularly scarce. In the early days water was obtained by distillation of the

brackish water found in desert lagoons, and sold at 7s. per 100 gallons. Consequently the cost of living and of gold-working was very high. At present water is supplied by a pipe-line laid from Perth. Nine pumping stations are situated about 40 miles apart, and at each the water is lifted through 140 ft. The charges made depend upon distance from Perth. At Kalgoorlie water costs 7s. per 1,000 gallons.

A new industry was introduced into Western Australia in 1920, when the Australian Electric Steel Company, whose head-quarters are at Sydney, opened some large steel works at Guildford near Perth. Western Australia possesses rich deposits of iron-ore, practically untouched, and smaller quantities of manganese, tungsten, and other metals essential to the steel industry.

Tasmania, separated from Victoria by Bass Strait—over 100 miles wide—forms part of the Commonwealth of Australia. The island was discovered in 1642 by Tasman, who was in charge of an expedition sent from Batavia, and named by him Van Diemen's Land after the Governor of Batavia. Convicts were landed where Hobart now stands in 1804, and the island was used as a penal settlement until 1853.

The country is a plateau dissected by many streams, and sloping gently towards the south-east. It possesses large forests which yield beautiful cabinet woods, extensive pasture lands, and considerable areas of agricultural land.

As regards the number of animals per square mile, Tasmania ranks third for sheep and fourth for cattle amongst the Commonwealth states. A large area is devoted to wheat, but the state is more famous for

its fruit, especially apples, which are exported in large quantities. Tasmania can hardly be said to possess manufacturing industries, but some British confectionery and textile firms started factories near Hobart and Launceston in 1921-2.

Papua. In Papua (British New Guinea), the portion of the island east of the 141st meridian, the Australian Commonwealth possesses a territory occupied almost entirely by coloured people—the native population is estimated at about half a million. In 1917 the occupations of adult male Europeans were : planters, 139 ; miners, 116 ; Government officials and employees, 119 ; missionaries, 70.

The natives are engaged mainly in agricultural work. The chief plantation industries are coco-nuts, sisal hemp, tobacco, maize, coffee, vanilla, and kapok. A large portion of the island is clothed with rich forests which yield ebony, dyewoods, sandalwood, and other valuable timber.

Gold and copper are being worked, and deposits of tin, lead, zinc, and other minerals have been discovered. Borings have been made in a petroleum field estimated to be 300 square miles in area.

EXERCISES

1. Read " Australia " in *The World and its Discovery*.
2. Give a short account of pastoral work in the eastern states of Australia, mentioning the factors which cause variations from one state to another.
3. Name the Australian ports specially concerned with the export of frozen meat, dairy produce, wool, wheat, and wine.
4. What advantages do the Australians possess for the development of industries ?
5. Write out a short summary of recent enterprises in Australia.

11. NEW ZEALAND

THE Dutch explorer Tasman, after discovering the island since named after him, continued his voyage eastward until he reached New Zealand. Apparently he took no steps to explore the new land, or even to determine whether or not it formed part of the great continent which was believed to exist in the southern hemisphere. This work was accomplished over 120 years later by Captain Cook, who, after sailing southward from Tahiti, sighted North Island in October 1769.

Cook sailed along the coast of North Island as far as the cape he named Turnagain, where he put his vessel about and sailed completely round the island ; then he circumnavigated South Island. Having set up the British flag and claimed possession of both islands in the name of George III, Cook set his course to the west, naming the point of departure Cape Farewell. But before leaving he sowed some wheat, and landed poultry and pigs, all of which flourished in the new land.

New Zealand definitely became part of the British Empire in 1840, when English settlements had been made in both islands by an association called the New Zealand Land Company. The early history of the colony was not very happy, owing to disputes between the settlers and natives with regard to the purchase of land. Massacres of Englishmen, reprisals on the Maoris, and finally definite warfare between the two races continued until 1846, to end, as one would expect, in the defeat of the natives. Further

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disputes in 1860 led to another war, which was not finally ended until 1870.

Such events naturally interfered with the flow of British settlers into New Zealand, but most of the

Thousands

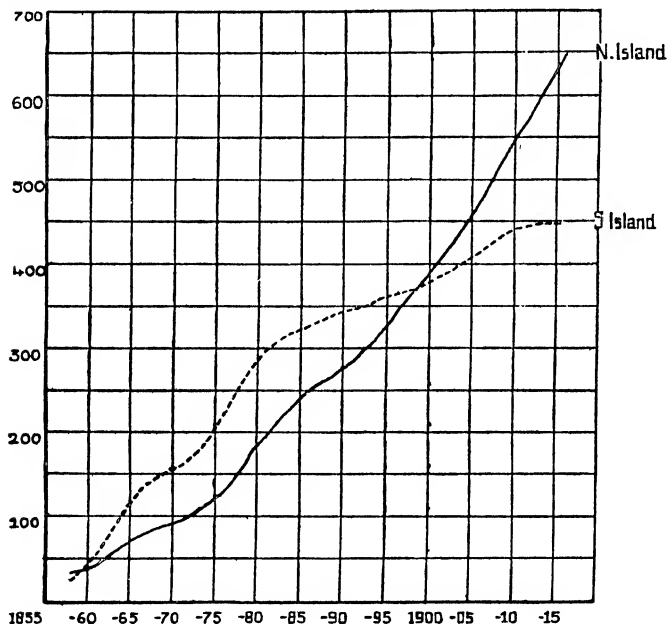


Diagram showing the rate of increase of the population of New Zealand (excluding Maoris) between 1850 and 1916.

fighting occurred in North Island. In South Island progress was hardly interrupted. A colony of Scotsmen was founded in Otago in 1848, the population in that year being 444. In ten years the population had grown to 10,500, and in twenty years to 56,500.

The rapid increase was largely due to discoveries of gold in Otago in 1861 and 1864, and a consequent rush of workers from New South Wales and elsewhere.

In addition to gold, New Zealand yields silver, iron, copper, manganese, cinnabar, tungsten, tin, platinum, sulphur, and coal; but though the mineral wealth is so varied in character it is not really great. The output of mines has been declining for some years.

New Zealand is essentially a pastoral country, a condition determined by physical and climatic

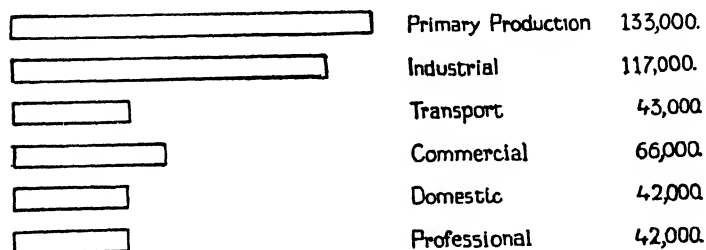


Diagram showing the proportion of the working population of New Zealand engaged in the six groups of occupations.

factors. Both islands are mountainous, and the trend of the mountain systems is from north-east to south-west. Thus they intercept the rain-bringing west winds, with the result that the eastern side of the country has a drier climate than the west. This was reflected at one time in the vegetation, for whilst the mountains, especially on the western side, were heavily forested with pines, the lower eastern region had large areas clothed mainly with tussock grass.

Bush fires and the demands of the building and export trades have caused a very serious reduction

in the amount of forest in New Zealand, and steps are being taken to improve matters. The forest has been replaced in many areas by grass. English grasses thrive everywhere on cleared land, and the winter is so mild that there are few places where there is not some growth even in the coldest months. Thus animals can live on food which they pick up for themselves.

The tussock grass that formerly grew on the lower land in the east has to a great extent disappeared. Banks Peninsula has long been a centre for the production of grass seeds (cocksfoot grass) to be used for making pasture land in both New Zealand and Australia. The Canterbury Plains, an almost level area, some three million acres in extent, midway along the eastern shores of South Island, has been transformed into one of the most famous sheep pastures in the empire.

With the exception of the dog and rat, which had been taken into the country by the Maoris, New Zealand was practically without animals when the white man appeared. At Queen Charlotte's Sound, Captain Cook let loose three pigs, and their descendants stocked the bush country. Settlers from Great Britain introduced the remaining English domesticated animals. They also introduced the rabbit, which multiplied until it became a pest; some compensation has been obtained in the form of increased revenues by the export of canned rabbit to the mother country.

In the production of wool and meat for export New Zealand has long occupied an important place, but the most remarkable development during the last

twenty years has taken place in the dairy industry. The value of the exports of butter and cheese increased from £700,000 in 1899 to over £7,000,000 in 1918. If South Island leads in meat production, North Island can claim first place in dairy work, for in 1919, out of the 598 dairy factories in the Dominion, 415

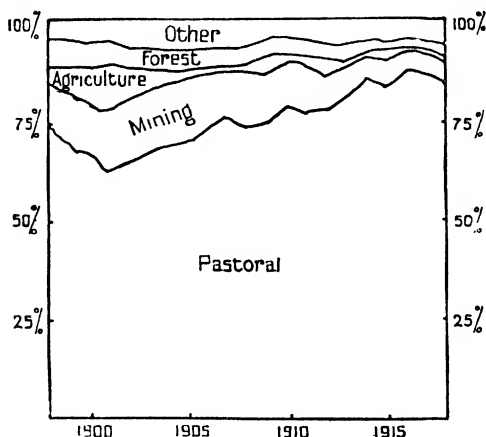


Diagram showing the percentage of exports supplied by the main industries of New Zealand 1898-1918. (After the diagram in the *New Zealand Official Year Book*, 1919.)

were in North Island. The dairy-farming regions are the rich plains of Auckland, Taranaki, and Wellington. In South Island, Otago produces more than all the other provinces together. The growth of pastoral work, including both dairy-farming and sheep-rearing, has materially aided the development of the ports Auckland, Wellington, and Napier in North Island, Lyttelton, Dunedin, Invercargill, and Timaru in South Island.

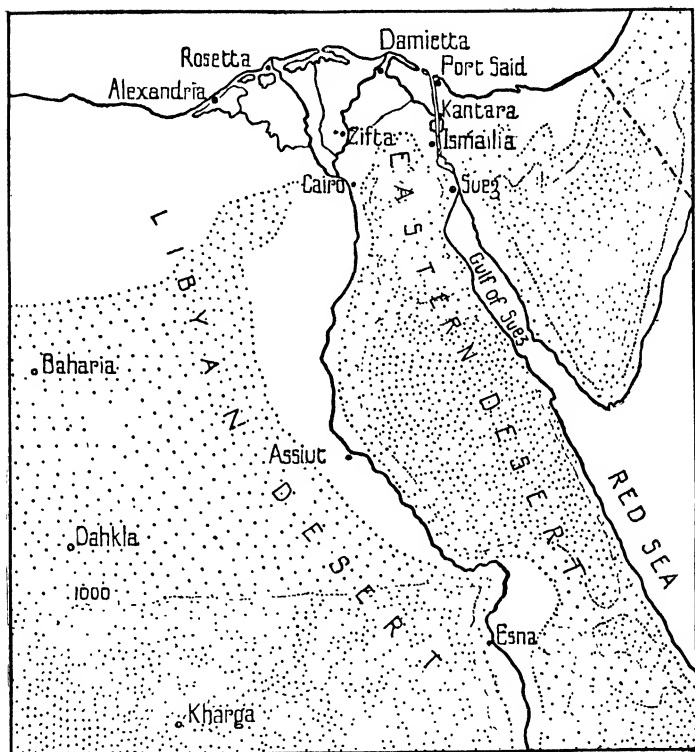
Another commercial commodity worthy of special mention is kauri gum, the product of a magnificent forest tree, the kauri pine, which also yields valuable timber. Kauri gum is fossil resin, used in the manufacture of varnish and linoleum. It is found deposited over large areas in Auckland, where only a portion of the forest remains, and is purchased from diggers by the Dominion Government. For several years attempts have been made to raise kauri gum from swamp-land by means of gold-dredges, but with only a small measure of success. Up to the end of 1918 over 350,000 tons had been exported ; but the annual output has been diminishing for some time.

EXERCISES

1. Read *Captain Cook's Voyages*.
2. What factors have determined the importance of New Zealand as a pastoral country ?
3. Write out a list of commodities exported from New Zealand to Britain, and describe any special means of transport required.
4. On an outline map of the world trace the routes of steamships between England and New Zealand.

12. AFRICA. PART I

Egypt. It is a remarkable fact that one of the earliest civilized states, Egypt, was established in a continent of which even the outline was unknown to Europeans until the sixteenth century. But over six thousand years before Portuguese seamen first sailed round the southern end of Africa, Egyptians had begun to record the history of their state. They



Egypt, showing the small proportion of land between the desert highlands that can be irrigated from the Nile. A large portion of the valley itself has not yet been made productive. Baharia, Dahkla, and Kharga are oases.

had made great progress in agriculture, constructed reservoirs for the storage of Nile water and canals for the purposes of irrigation and commerce; they had manufactures of paper, linen, muslin, and other

goods, and they had built monuments and palaces unsurpassed in many respects by those of any other people.

Though the most advanced in manufactures amongst the peoples of the ancient world, the Egyptians—with the exception of a small number engaged in the manufacture of silk, calico, pottery, and tobacco—are now devoted to primary production.

The country is practically rainless. The only productive portions are those which lie within the range of the Nile irrigation system, viz. the delta and the valley of the Nile. The valley, having been carved out of a desert plateau, is bounded on both sides by high cliffs, and the land available for cultivation is very limited. The total area of the country is 222,000,000 acres, but only 8,000,000 acres can be cultivated.

In the valley, irrigation is carried out chiefly on the “basin” system, under which the land is flooded with water to the depth of about 3 ft. during the flood season. Wheat, millet, barley, beans, clover, vetches, and lentils are sown when the water has run off.

The Delta is irrigated by the “perennial” system, which consists of a network of deep canals in which water flows throughout the year. In this area the crops are cotton, maize, millet, wheat, rice, beans, barley, clover, and vegetables; more than one crop of some of these can be raised in the year. Egyptian cotton is a fine long-staple variety, used in the manufacture of thread and mercerised cloth. It forms 90 per cent. (in value) of the total exports.

The British have greatly improved the irrigation

works of Egypt, by constructing dams at Zifta, Esna, Assiût, and Aswân.

Cairo, the centre of the Delta railway system, is connected with Alexandria and Rosetta on one hand, and Damietta, Port Said, and Suez on the other. The city is also the terminus of the railway that is to link Egypt with Cape Colony, and it stands at the point of intersection of air routes to (1) Cape Town, (2) Damascus, Baghdad, and Delhi, (3) Marseilles and London, so that of its future importance there can be little doubt.

West of Egypt lies Tripoli, a country without rivers and with very uncertain rainfall. A good harvest can only be expected once in every four or five years, and the amount of commerce transacted is therefore determined by rainfall.

The Atlas Region. Beyond Tripoli, westward, there lies the Atlas region, consisting of three states, Algeria, Tunis, and Morocco, of which the first is regarded as an integral part of France, and the other two are French protectorates. The three have many points of similarity, each producing the typical Mediterranean fruits and grain, and each having a large area of mountain pasture visited by nomadic tribes with flocks of sheep and goats, and yielding esparto grass. The bulk of the trade of these countries, consisting of export of wine, grain, olive oil, esparto grass, and skins, is done with France. The chief trading centres are Algiers, Bona, and Bizerta.

The Canary Islands, which lie off the Atlas coast, are of special interest to Britain; for though they belong to Spain the principal coaling, shipping, and fruit-growing concerns are under British control.

The annual value of the fruit (bananas and tomatoes) and vegetables exported reaches $2\frac{1}{2}$ million pounds. Teneriffe and Las Palmas are coaling stations visited by ships of all nations. Supply stations for oil fuel are now being established.

Exploration of Central Africa. South of the countries referred to above there lies the greater part of Africa, which for so long remained an unknown land to Europeans. During the sixteenth century European traders began to frequent the coast of West Africa in search of ivory, gold, and slaves, and some attempts were made to open a way to Timbuktu, a town described by Arabs as having great wealth.

Trading stations were also established on the east coast, and before the end of the seventeenth century permanent settlements had been made in South Africa, but there is no record of any serious attempt to explore the interior, up to the end of the eighteenth century. Then in 1788 the African Association of London was formed with the object of pushing forward the work of exploration in Africa. The African Association sent out Mungo Park to trace the Niger; he was drowned in the river before the work was completed. Not until 1830 was this stream followed through the dense swampy forests of Nigeria to the sea.

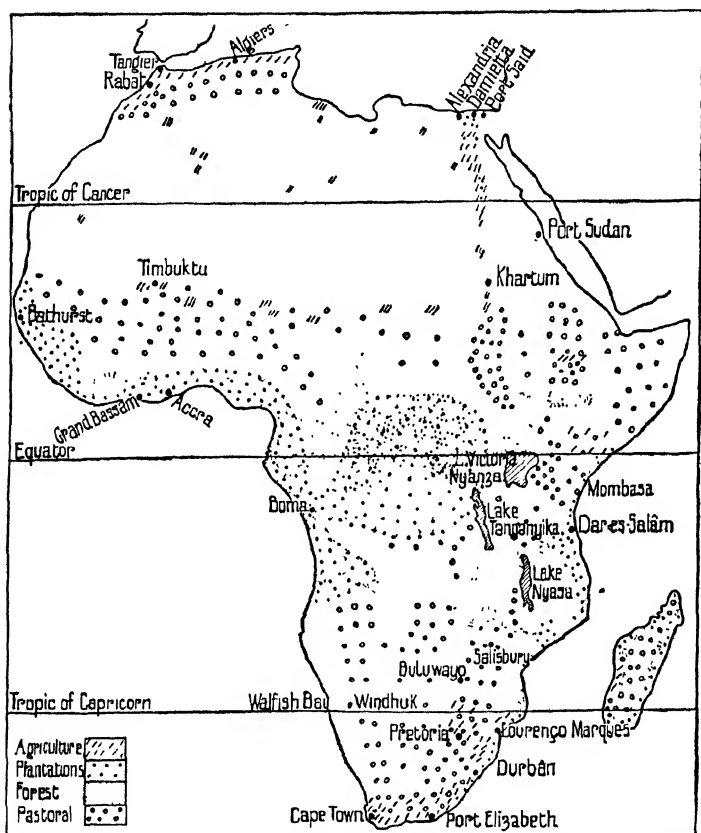
Burton, Speke, and Grant solved what was known in the middle of the nineteenth century as the Nile Problem. They followed the river up to its sources, passing from desert to savanna, and from savanna to forest, and finally discovering the Great Lakes of Central Africa, Albert Nyanza and Victoria Nyanza.

The Blue Nile had previously been traced back to the Abyssinian Highlands.

The greatest task in connexion with African exploration was that undertaken by Livingstone in the vast forested region of the Congo and the Zambesi, to which he gave twenty years of his life. As a result of his labours the world became acquainted with the geography of that portion of the continent between the Equator and the tropic of Capricorn. He traced the Zambesi and the head-waters of the Congo ; he discovered the Victoria Falls and a number of large lakes ; he made out the connexion of Lakes Tanganyika, Nyassa, Bangweolo, and others with the river systems ; and he collected a great deal of information with regard to the vegetation, climate, and inhabitants of the region. Livingstone died near Lake Tanganyika in 1873, and his work was afterwards carried on by Stanley, who traced the whole course of the Congo, and discovered the Stanley Falls.

The discoveries briefly referred to above paved the way for the partition of Africa amongst European powers. Before Stanley had completed his survey of the Congo, a conference assembled at Brussels agreed upon the forming of a state embracing practically the whole of the Congo basin, and now known as Belgian Congo.

We need not enter into details with regard to the division of Africa ; within fifteen years almost the whole of the continent had been allotted to England, France, Germany, Portugal, and Belgium. The German possessions, East Africa, South-west Africa, Cameroons, and Togoland, were taken by British



Africa, showing situation of the more important agricultural, pastoral, and plantation regions. In many of the unmarked areas the natives practise primitive agriculture. The marks in the Sahara indicate oases where dates and cereals are produced.

Imperial forces, with some assistance from the Belgians and the Portuguese, during the European War.

The Forests and Plantations of West Africa. Belgian Congo, the one "colony" of Belgium, inhabited by some fifteen million black people and about five thousand Europeans, is a most productive land. The climate is hot and wet, and in all parts of the country there are luxuriant forests which yield such valuable timber as mahogany and ebony, and large quantities of rubber and palm oil. The Congo and its tributaries provide in all 10,000 miles of waterway; interruptions in the form of waterfalls and rapids occur, but railways have been built to carry traffic past Stanley Falls and past the rapids below Leopoldville, and all parts of the country have means of communication with the port of Boma.

Belgian Congo is a portion only of the African tropical forest region, for similar climatic conditions and vegetation prevail throughout the coastal region adjacent to the Gulf of Guinea, which includes French Congo, Cameroons, Nigeria, Dahomey, Togoland, Gold Coast Colony, Ivory Coast, Liberia, and Sierra Leone. The region as a whole is over a million square miles in extent; it has a great population of which whites form an insignificant minority.

The productions of the Guinea region are similar to those of Belgian Congo, first in importance being palm oil and palm kernels obtained from trees growing wild in the forests. The oil-palm requires a warm climate, and rainfall to the extent of 40 to 60 inches per annum. Such conditions prevail in West Africa, and also in Sumatra and Malaya where the cultivation

of the oil-palm has been started quite recently. Guinea is at present the chief palm-oil producing region in the world; Duala and Rio del Rey on the Cameroons coast are important collecting centres. The oil is used as food by the natives, but many thousands of tons are sent annually to Britain and other countries for use in the manufacture of soap and candles. There is also a large export trade in palm kernels, the oil of which is used in the margarine industry.

West Africa has also become an important cocoa-producing region. The climate is well suited to the cacao plant, and plantations are particularly numerous in Gold Coast Colony, Cameroons, French Congo, and the island of St. Thomas. The last of these is a Portuguese possession in the Gulf of Guinea, and situated on the Equator. The plantations on this island, worked by negroes, produce about one-sixth of the world's cocoa.

Large quantities of rubber have been obtained from wild trees in the Guinea region, but reckless tapping has proved very destructive, and rubber plantations have been laid out in almost every colony. The result is that native workers are being gradually withdrawn from the collection of forest products to the more systematic work of agriculture. Grand Bassam on the Ivory Coast, Accra in Gold Coast Colony, Lagos and Calabar in Nigeria are the chief commercial centres.

The African Savannas. Belgian Congo extends eastward as far as a line of lakes that includes Tanganyika and Albert. On the eastern side of the lakes there lies Kenya Colony (British East Africa),

a region of very different type. It is part of the African savanna land, clothed with tall grass—burnt up in the dry season—prickly shrubs, and in some places with trees, which give a park-like appearance to the landscape.

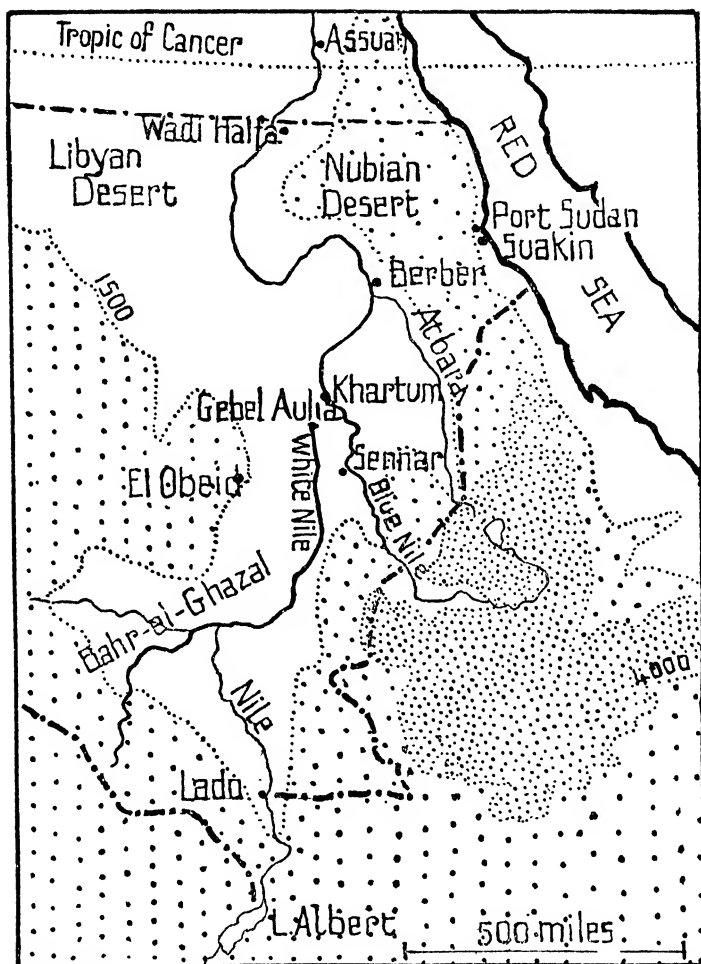
The African savanna region, even greater in extent than the tropical forests, may be considered in two parts. The northern portion stretches across the continent south of the Sahara, as a broad belt called the Sudan; it includes the northern parts of Nigeria and the adjoining colonies. The southern portion stretches southward from the eastern end of the Sudan, over the lofty plateau that occupies southern Africa, and through Kenya Colony, Portuguese East Africa, Tanganyika Territory (formerly German East Africa), Rhodesia, and Angola (Portuguese West Africa) to the Atlantic coast; it also includes the central part of the island of Madagascar. The savanna passes gradually into scrub-land that borders the Sahara in the north and the Kalahari in the south. Forest does occur within the borders of this savanna region; it is restricted mainly to narrow belts along the courses of the Niger, Nile, Zambesi, and other rivers, and to the higher parts of mountain slopes.

THE SUDAN. The character of the West Sudan varies from rich savanna in the basins of the Senegal, Gambia and Upper Niger to poor pasture and thickets of gum acacia on the borders of the Sahara and Lake Chad. The poorer land is occupied by pastoral nomads, and the chief products are gums and hides. The more favoured portion is a rich agricultural region with a large negro population, yielding crops of millet, maize, wheat and rice, cotton,

indigo, tobacco, and kola nuts. Native industries consist of the manufacture of cotton cloth and leather. Trading is largely in the hands of the Hausas, an enterprising tribe located between the Niger and Lake Chad, whose chief town is Kano; the Hausas have long had trading relations with the Guinea coast, the Mediterranean (Tripoli), and the Red Sea.

Anglo-Egyptian Sudan includes the middle portion of the Nile basin, and consists partly of desert and partly of savanna, according to the amount of rainfall. North of the latitude of Berber rainfall is nil, and agriculture is possible only near the river. South of this rainless belt there is an area with low rainfall distinguished by poor ostrich pastures and forests of acacia. From the latter is obtained gum arabic; the Sudan is the world's chief source of supply of this particular commodity. Farther south still, in Bahr-el-Ghazal, there are two rainy seasons; the vegetation is much richer, and the products include rubber, mahogany, and ivory.

Thus a large portion of Anglo-Egyptian Sudan is occupied by semi-nomadic people, who practise agriculture during the rains, and move towards the Nile during the dry season. It is believed that the region could be made into an important cotton-producing area, and with this in view there has been prepared a scheme, supported financially by the British Government, for the irrigation of the Gezira—between the White and the Blue Nile—Kordofan, and the country south of Khartum. The scheme involves the construction of a dam on the Blue Nile at Sennar, one on the White Nile at Gebel Aulia, and a reservoir at Khartum. The Sennar dam was completed in 1925,



Anglo-Egyptian Sudan (boundary — · — · —) with contours 1,500 and 4,000 ft. The main railway connects Wadi Halfa, Berber, Khartum, Sennar, and El Obeid; a branch line from Port Sudan and Suakin joins the main line south of Berber.

and we may expect the number of nomads in the Gezira to be considerably reduced.

Abyssinia, a highland region between the Sudan and the Red Sea, has practically no commercial relations with the rest of the world. Its people are largely engaged in pastoral work; but cotton and coffee are grown up to an altitude of 5,000 ft., and grain at higher altitudes. The adjoining area, Somaliland, is in the main a pastoral region.

THE SOUTHERN SAVANNA REGION. The coastal belt of Kenya Colony and Tanganyika Territory has a hot damp climate that favours the growth of rubber-trees and coco-nut palms, and it is not therefore part of the savanna region. It is not suitable for European settlements, but the ports Mombasa and Dar-es-Salâm are outlets for the produce of the interior.

Zanzibar, a British protectorate off the coast of Tanganyika Territory, is said to be the best place in the world for the production of cloves.

The savannas of the interior, having an altitude of over 4,000 ft., have a climate well suited to Europeans, and this applies generally to the adjoining area Rhodesia. From the commercial point of view the southern savanna region is one that awaits development. The process has already commenced, for British farmers have settled in considerable numbers in Kenya Colony and Rhodesia. Cattle-rearing is a most important occupation amongst the natives, and a large number of white settlers have taken up the same kind of work. In addition much attention is now being paid to ostrich-farming and sheep-farming in both colonies, whilst pig-breeding and bacon-curing have become well-established industries.

At the same time attempts are being made to develop agriculture; five government farms have been established near the Uganda railway. Very satisfactory experiments in cotton-growing have been made in Kenya Colony and sisal hemp is grown on a large scale. Fine crops of maize are grown in both Kenya and Rhodesia, and tobacco is grown extensively in the latter. Fruit-farming is a special feature in both, nearly all Mediterranean and English fruits being grown with great success. Tanganyika Territory, which has recently come under British rule, will be developed along the same lines as Kenya Colony. In Nyasaland, a protectorate south of Tanganyika, agriculture has made great progress. Cotton and tobacco are very important; they come first and second in the export trade. Chillies, coffee, oil-seeds, ground-nuts, and rubber are also exported.

West of Kenya lies the British Protectorate Uganda (native capital Mengo, British head-quarters Entebbe), where great attention is paid to agriculture. The chief crops are cotton, grown by natives, coffee, and rubber, grown on Europeans' plantations, and all exported to Britain. Experiments in growing sisal hemp and ramie have proved successful. There are enormous tracts of elephant grass and papyrus, which it is believed would be valuable material for paper-making. Probably this industry will be started in the near future, for it is proposed to harness the Ripon Falls, over which the Nile rushes on leaving Victoria Nyanza.

Probably the greatest need of the savanna region, after irrigation, is improved means of communication. The Cape-to-Cairo railway, when completed, will

traverse the southern savannas and Anglo-Egyptian Sudan ; there is at present a great gap between El Obeid in the Sudan and Kambove in Belgian Congo. Railways to the coast are of greater commercial value, and of these there are three important lines, viz. the Uganda railway, connecting Port Florence on Victoria Nyanza, Nairobi, and Mombasa ; the East African Central Railway, from Kigoma and Ujiji on Lake Tanganyika to Dar-es-Salâm ; and the Beira and Mashonaland railway, linking the port of Beira with Salisbury, whence there is a connexion with Bulawayo and the Cape-to-Cairo line. A short line connects Blantyre, the capital of Nyasaland, with the Zambesi steamboats which ply to Chinde, a port in Portuguese territory. But a great part of the region is not in touch with railways ; waterways are very limited, and roads, except near such towns as Nairobi, are indifferent in quality.

The savanna region is not without mineral wealth, but the output is not very great. Gold is worked in Rhodesia, and traces of gold and copper have been discovered in Kenya Colony. The most remarkable feature of the latter colony is the Magadi Soda Lake. Here there is an enormous deposit of carbonate of soda, 30 square miles in extent and 10 ft. deep, worked by the Magadi Soda Company. Natural soda is gained in blocks which are dried, ground to powder, and packed in bags for export through Kilindini (Mombasa). A branch railway connects the works with Magadi Junction on the Uganda railway.

EXERCISES

1. Read *A Trip up the Nile* and *The Opening-up of Africa*.
2. Give reasons why Egypt is still a land of primary producers, though occupied by civilized people thousands of years ago.
3. What advantages has Egypt received from British enterprises?
4. Explain the importance of Cairo as a route-centre, and illustrate your answer by means of a diagram.
5. Explain the importance to the commercial world of Belgian Congo and the West African states.
6. Write a short account of the economic resources of Rhodesia and Kenya Colony.
7. What enterprises have been planned for the development of Anglo-Egyptian Sudan?

13. AFRICA. PART II

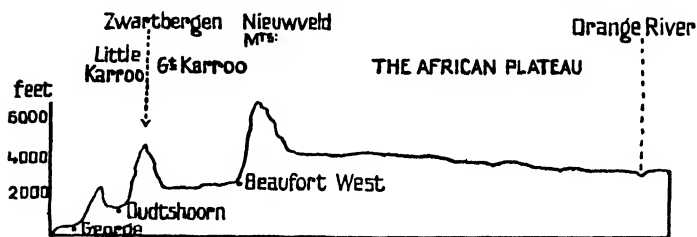
THE UNION OF SOUTH AFRICA

THE African plateau extends almost to the south coast of the continent. Its end is marked by the Nieuwveld Mountains in the colony of the Cape of Good Hope, and by the Drakensbergs in Natal. From these ridges the land falls away to the sea by a series of terraces rather narrow in Natal, but of considerable extent in the Cape Colony. Below the Nieuwveld Mountains lies the Great Karroo, about 3,000 ft. above sea-level. Along its southern edge rises the Zwarte Berg ridge, to fall steeply again to the Little Karroo, which is about 1,250 ft. above the sea. The Langberg range (2,000 ft.) separates the Little Karroo from the coastal plain—or plateau, as it is sometimes called—for many parts of it have an altitude of

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1,000 ft. Bounded by mountain ridges on each side, the Karroos have therefore a trough-like form.

The southern portion of Africa consists of South-west Africa (formerly German South-west Africa), Bechuana Land, and the four provinces of the Union of South Africa, some particulars of which are given in the table below. As settlement of this region extended from the south northwards, it will be convenient to describe the country in that order.



Diagrammatic section of the southern end of the African plateau.

THE UNION OF SOUTH AFRICA

<i>Province.</i>	<i>Area (sq. miles).</i>	<i>Population (1911).</i>	<i>Capital.</i>
Cape of Good Hope	276,995	2,564,965	Cape Town
Natal	35,290	1,194,043	Pietermaritzburg
Orange Free State	50,389	528,174	Bloemfontein
Transvaal	110,426	1,686,212	Pretoria

In 1911 Europeans formed 21·37 per cent. of the total population.

When the world learnt at the end of the fifteenth century that a new commercial highway to India had been discovered, no one dreamt of the effect upon South Africa which the use of that highway would produce. Dutch, British, and French navigators followed the lead of the Portuguese into the Indian

Ocean, and it was with the object of making a break in the long voyage that Cape Town was founded as a Dutch settlement in the year 1651. English, Scottish, and French colonists followed in due course, and other small settlements were made, some near to Cape Town, others in the coastal plain; before long settlers found their way into the Karroos. During a war between Britain and Holland at the beginning of the nineteenth century, the colony came into the possession of Britain; Holland afterwards received £6,000,000 as compensation.

In 1820 the British Government formed a new settlement by landing 3,000 people on the sandy shores of Algoa Bay. A town was laid out there and named Port Elizabeth; it has developed into one of the chief seaports of Cape Colony.

Until 1823 Natal was practically unknown to Europeans. The country had formerly been occupied by a number of native tribes, which were all but destroyed by a terrible Zulu raid in the early part of the nineteenth century. In 1823 some English explorers landed in the Bay of Natal, where Durban now stands. They found a beautiful land, with the Drakensbergs so near to the sea that the country consisted almost entirely of the eastern slopes of those mountains. The population was composed of a few hundred natives living in the kloofs and glens of the mountains.

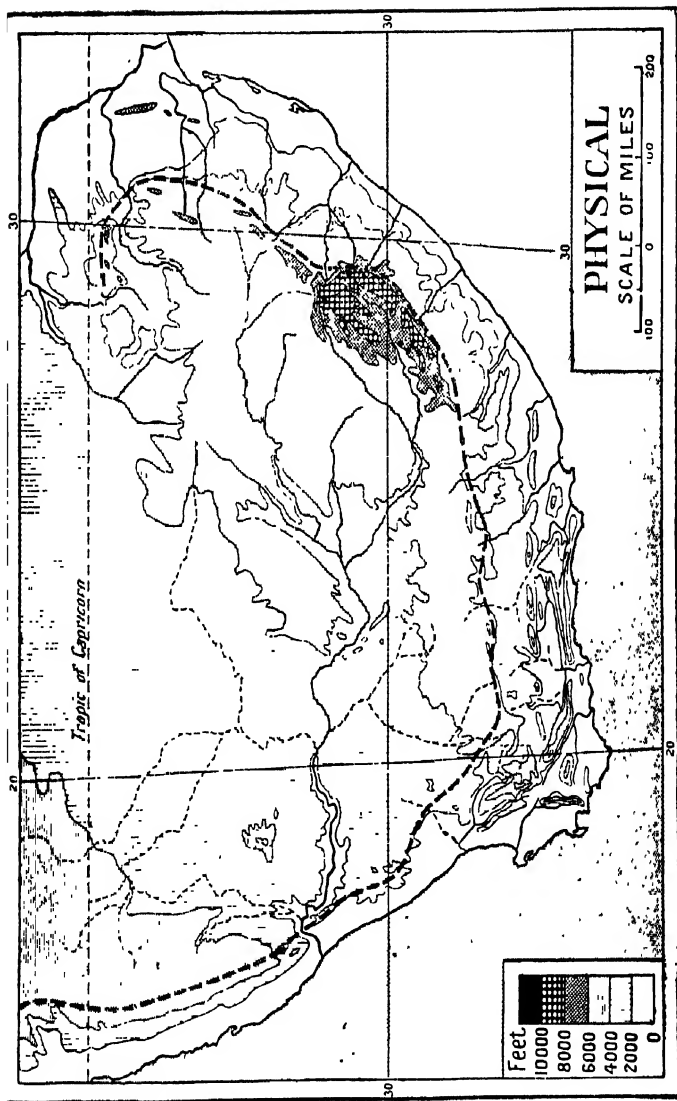
By means of presents the Zulu chief was induced to allow Englishmen to settle on the bay, and Durban was founded. Other English colonists arrived, and Dutch farmers (Boers) made their way into Natal through a pass in the Drakensbergs. We cannot

follow the troublous history of Natal in detail. Struggles between the settlers and the Zulus, and between the British and the Boers, occurred at intervals for over half a century. In 1887 Zululand was annexed by Great Britain, and since then there has been comparative peace. Many Boers left the country in 1848.

Before the end of the nineteenth century, many of the Boers in Cape Colony, dissatisfied with British rule, and especially with the law that abolished slavery, decided to seek fresh territory. Then came the Great Trek, when some 10,000 Boers crossed the Orange River. Joined later by the trekkers from Natal, they formed new colonies on the High Veld, which are now called the Orange Free State and the Transvaal.

In many respects South Africa is similar to Australia. In neither country is the average temperature very low; each possesses eastern highlands that receive moderately heavy rainfall, an interior with deficient rainfall and which becomes drier and drier towards the west, and a south-western corner that is snatched from the grip of the desert by winter rains. In each land the activities of the people are directed mainly to primary production, and in each the great need of pastoral workers and agriculturalists alike is more water.

A journey from the south coast to the highlands of the interior brings remarkable changes in landscape. From the vineyards and well-wooded areas of the coastal plain one passes to the dry veld of the Little Karroo, thence to the Great Karroo sparsely covered with small dry-looking shrubs—Karoo bush



The Physical Features of South Africa.

—and from this to the far-stretching pastures of the High Veld on the plateau.

A deflection north-westward from Mafeking leads through the pastoral country of the Bechuanas, the home of wild ostriches, to the Kalahari Desert, a region of poor grassland and, after rains, of salt-pans, swamps, and brackish lakes. In 1920 there was brought forward a scheme for irrigating this desert by damming the rivers to the north. If this should be carried out the Kalahari may be made into valuable ranching country.

Conditions are somewhat better in at any rate a part of the adjoining area, South-west Africa, where the highlands bear coarse long grass and clumps of acacia and palms, whilst willows and mimosa grow near the Orange River. But the western portion of the country is a desolate waste of shifting sands, of dunes rising to an altitude of 600 ft., devoid of vegetation except for a few plants that contrive to grow around salt lagoons.

Farming on a big scale was first started in South Africa quite close to Cape Town, where Rondebosch now stands. This town is of special interest in containing a handsome building, Groote Schuur, formerly the property of Mr. Cecil J. Rhodes, the empire-builder of South Africa, and after whom Rhodesia is named. Under the terms of Rhodes's will, Groote Schuur has become the residence of the Prime Minister of the Union.

The vine was introduced into the Cape province at an early date, and it has been found to grow better in the Cape Town district than in any other part of South Africa. Stellenbosch, Worcester, Paarl,

and Constantia are surrounded by vineyards, and at Constantia there is a government experimental vineyard containing 140,000 vines. The fruit is grown partly for export and partly for the wine industry.

The climate of South Africa generally is very suitable for fruit-growing, and this branch of agriculture has been greatly developed during the last twenty years, fostered by trade with Britain, made possible by cold storage chambers on ships. The list of fruits produced—many of them in the Cape province—includes figs, ready in November, apricots in December, strawberries in January, apples and pears in February, grapes in March and April, and oranges from June to September.

Natal having a damper climate than the rest of the Union is rather more important as an agricultural land. The country may be regarded as consisting of three zones, differing in altitude, viz. a hot coastal zone, producing tea, sugar-cane, and such fruits as the pineapple and orange; a temperate zone where cereal crops are raised; and a high pastoral zone devoted largely to sheep-rearing, but also yielding grain.

Still no one would describe South Africa as a whole as an agricultural land. There is a deficiency of rainfall in most parts, and there are few rivers available for irrigation purposes. It is hoped, however, that great developments in agriculture will take place as a result of adopting the system of "dry-farming", i.e. ploughing deep and keeping the seed-bed moist with a blanket of fine dry soil.

The country is well adapted to pastoral work, and this occupies a large proportion of both native and

white population. Ostriches are reared in the Little Karroo, especially in the district around the great feather-market, Oudtshoorn. The vegetation of the Karroos is hardly suitable for cattle, but sheep and goats are to be found there in large numbers. Both cattle and sheep are reared on a big scale in the east of the Cape province, and in the vast grassland region that extends through Orange Free State and the Transvaal, to the borders of the Bush Veld in the north of the latter province. The export trade in wool, hair, hides, and skins is very important.

But when the export-trade returns are examined it is found that everything else is overshadowed in value by gold and diamonds. Diamonds were discovered near the River Vaal in 1867, at a time when South Africa was experiencing a period of depression, due to serious losses of cattle and sheep by droughts and restriction of the market for wine. Matters were improved by the opening of diamond diggings, for within two years over 10,000 men had flocked to the workings, and the town of Kimberley came into existence. There are diamond mines at Jagersfontein in Orange Free State, and there is the well-known Premier mine in the Transvaal; but Kimberley remains the chief centre of the industry, the most valuable workings being those owned by the De Beers Company.

The Transvaal possesses mineral wealth in wonderful variety, but only gold and coal have yet been worked on a large scale; and gold is much the more important. There are large gold-yielding areas in many parts of the country, at Pietersburg, Barberton, Klerksdorp, Potchefstroom, and other places; but

most important of all are the mines on Witwatersrand ridge, briefly described as The Rand.

It was the discovery of the Rand goldfield in a bleak almost uninhabited region that brought into existence in 1886 the mining camp which by degrees developed into the city of Johannesburg. Within ten years a population of 100,000 had been attracted to the town ; in twenty years the population had almost reached a quarter of a million, about half being whites.

Perhaps it will be thought strange that the Cape-to-Cairo Railway does not pass through the important towns of Orange Free State and the Transvaal, but through Kimberley and Mafeking, which are just beyond the western boundary of those colonies ; but when the scheme was mooted by Cecil Rhodes, it was intended that the line should be "all-red" (i. e. on British territory only) if possible, and Orange Free State and the Transvaal did not at the time form part of the British Empire.

But Johannesburg is in railway communication with Mafeking and Kimberley, and also with all the important seaports on the east coast—Lourenço Marques, Durban, East London, and Port Elizabeth. The line to Durban passes through the Drakensbergs by a famous pass, Laing's Nek (5,399 ft.), which lies below the equally famous Majuba Hill.

During the last few years there has been a considerable industrial development in South Africa, arising mainly out of conditions produced by the European War. The output of coal in Natal and the Transvaal has been increased, and new markets for this commodity have been found in Argentina, the East Indies, and Egypt.

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Pretoria has made progress as an industrial centre, having now an iron industry on a small scale and factories for the manufacture of tanning extract from wattles, motor fuel from molasses, and starch from maize.

EXERCISES

1. Make out lists of the agricultural products of the Cape Colony and Natal.
2. Write an account of the different kinds of pastoral work carried on in South Africa.
3. Make lists of the commodities exported from each of the four provinces of the Union.
4. Describe and account for the recent industrial development in South Africa.
5. Mark on an outline map all the lines of communication between England and South Africa.

14. ASIA. PART I

THE PASTORAL LANDS

ONE of the most wonderful of traveller's tales is Marco Polo's account of an overland journey from the Mediterranean shores to Peking, made in the thirteenth century. In this book Polo gave a great deal of information about regions previously quite unknown to Europeans—the interior of Asia and the south-eastern part of the continent. For six hundred years thereafter, no important addition was made to European knowledge of the interior of Asia and the Far East, and even to-day it has to be admitted that these territories are imperfectly known.

Barriers, some physical, some climatic, and some arising from the attitude of the Chinese and other

peoples, have always exercised a restraining influence upon the activities of explorers, and have at the same time retarded the progress of peoples in eastern Asia ; but the human barrier has been greatly weakened during the last half-century.

On the other hand, south-western Asia, the region between the Black and Mediterranean Seas on one side and the Arabian Sea on the other, was well known in very early times—at any rate to the trading world. It appeared to merchants in Mediterranean lands as a storehouse of most desirable commodities, articles of glass, bronze, ivory, and other materials manufactured by the Assyrians themselves, and precious stones, cotton, spices, ivory, and silk which they obtained from India.

The goods were carried by caravans along desert highways that connected the chief towns in Syria, Mesopotamia, and Egypt, towns which served as markets for European traders. Later on caravan routes were established through Central Asia, via Merv, Bokhara, and Kashgar, along the line now followed in part by the Trans-Caspian Railway ; thus a trade connexion with the Far East was made.

This is somewhat ancient history, but it is not without a bearing upon the modern world. Commodities from the East, luxuries at first, were soon regarded by Europeans as essential. It was the search for a better route to the Indies that sent Columbus across the Atlantic and Vasco da Gama round the Cape of Good Hope, and that brought the world to the Age of Ocean Navigation. It contributed to the decline of Venice, Genoa, and the Middle East, and to the commercial prosperity of Britain, Holland, and France.

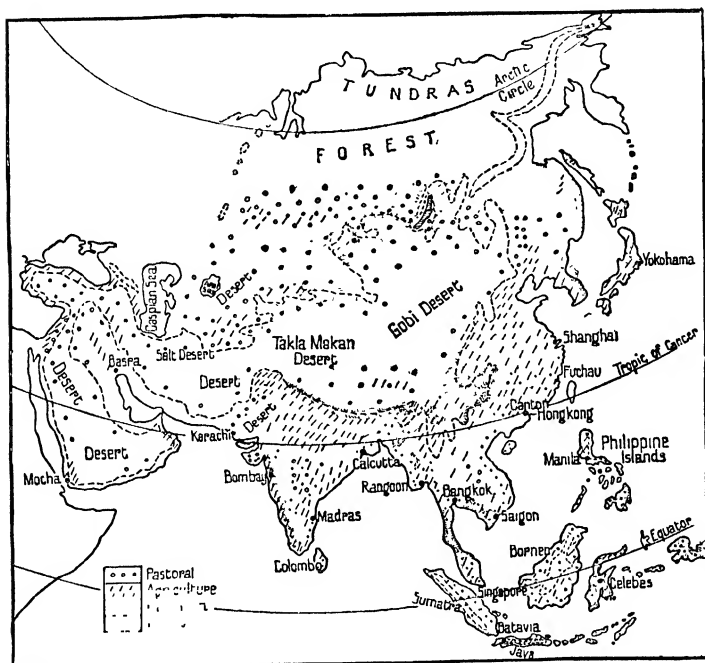
Asia is remarkable for contrasts. It possesses in the Himalayas and Tibet the loftiest regions in the world, and in the Dead Sea and Caspian areas the deepest depressions ; it has the most extensive highlands and the greatest plains. No continent has so many long rivers, and none so many that lose commercial value by flowing into an unfrequented ocean. Asia contains the region with greatest annual range of temperature, the coldest place in the world, the place with greatest annual rainfall, some of the richest jungles, and some of the most hopeless deserts.

The highland region of Asia is stupendous in character. The huge plateaux of Arabia, Asia Minor, Iran, Pamir, and Tibet, and lofty mountain systems such as the Himalayas, Thian Shan, Altai, and others, lie, roughly speaking, diagonally across the continent ; but this highland diagonal varies in width from 500 to 1,000 miles, and breaks in its course are remarkably few.

The lowlands are therefore in the north-west and south-east parts of the continent. On the north-west side there is Siberia with its belts of tundra, forest, and grassland, and a group of states east of the Caspian—Trans-Caspia, Khiva, Bokhara, and Turkestan—throughout the greater part of which desert and steppe struggle for supremacy.

On the south-east side lie the monsoon region, the East Indies, and Japan. Some of the land is only comparatively low, for parts of the Deccan, Southern China, Japan, and the East Indies are over 1,500 ft. in altitude, though well dissected by rivers. Truly lowland areas are found in the valleys and plains of the Hoang-ho, Yangtse-kiang, and Si-kiang in China,

the Mekong in Indo-China, Irawadi in Burma, the Ganges and Indus in India, and the Euphrates and Tigris in the Middle East.



Asia, showing the chief pastoral, agricultural, and plantation regions. The highlands are enclosed by the broken line, which is approximately the 3,000 ft. contour.

The highland belt is more than a physical barrier ; it divides the peoples of Asia into two groups whose occupations and mode of living are essentially different. Though the manufacture of textiles was well established in different countries at least sixty

centuries ago, the vast majority of the people of Asia at the present day are engaged in primary production. In the highland region itself and on the north-western side of it occupations are mainly, but not wholly, pastoral; on the south-western side the people are mainly engaged in agriculture. The exceptions and the recent industrial development in the Far East will be duly noted.

The Pastoral Lands. (i) **The Central Highlands.** The central highlands of Asia form a vast region of steppe and desert. The Takla Makan and Gobi deserts lie in basin-shaped depressions, bounded on each side by high ridges which have the effect of making the territory below them practically rainless. Around the deserts are tracts of grassland, very poor in some places, and especially in Tibet, but very good in the well-watered region of northern Mongolia. The grasslands are peopled by nomadic and semi-nomadic tribes engaged almost entirely in pastoral work. Many of them have no connexion with the outer world; but Tibet and Mongolia carry on trade with China—exporting the products of their flocks and herds. The Mongolians send about a million sheep yearly to China, in addition to skins, furs, camels' hair, and wool.

There are two important caravan routes across the highlands. One is the famous tea-caravan route across the Gobi Desert, from Kalgan (north-west of Pekin) to Urga, the capital of Mongolia. Since 1917 there has been a summer motor-service along this route for the conveyance of goods. From Urga the caravan route is continued to Kiakhta near Lake Baikal. The second trade route passes through the

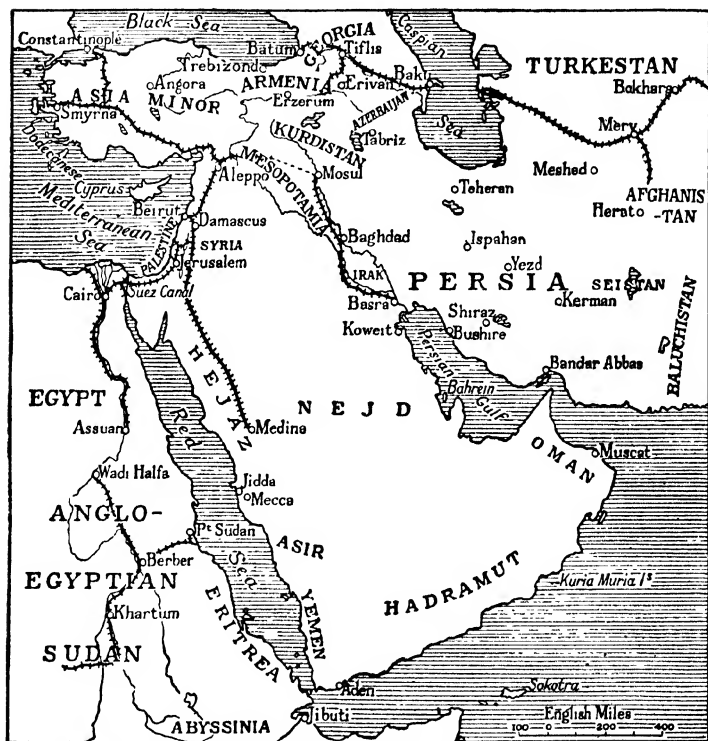
Dzungarian Gate, a gap between the Thian Shan and Altai mountains, six miles wide at the narrowest part.

(ii) **South-Western Asia.** "Middle East" is a name that has been given by British people to lands around the Persian Gulf—Arabia, Irak (Mesopotamia), Persia, Afghanistan, and Baluchistan—whilst "Near East" has been applied to Asia Minor, Syria, and Palestine. These two regions, together with Turan which lies east of the Caspian, may be considered as one. They form one region in that the people are largely engaged in pastoral work, rearing horses, cattle, sheep, goats, and camels, and in each division there are large numbers leading a semi-nomadic life; agriculture is practised to some extent, but only with the aid of elaborate irrigation works.

Cultivation is therefore restricted mainly to the plains and valleys near the sea, such areas being especially numerous around the plateau of Asia Minor, and beside the courses of such rivers as the Tigris, Euphrates, Amu, and Syr. The whole region has many features in common with the Mediterranean region, of which Asia Minor, Syria, and Palestine are, of course, a part. The chief difference is an increasing dryness of the winter season towards the east.

The crops grown are in general of truly Mediterranean type, such as the olive, grape, fig, orange, mulberry, with wheat and barley in Asia Minor, the Levant, and Mesopotamia, maize and rice in Persia, especially on the south shores of the Caspian, and barley in the Amu and Syr region. In addition there are certain special crops. Cotton is grown to some extent in each area, and on a large scale in Khiva and

Bokhara, from which states it is sent by caravan to the nearest railway station for export to Russia. Opium in Asia Minor and Persia, coffee in south-west



Towns and Territorial Divisions of South-west Asia.

Arabia, and tobacco in Asia Minor and Syria, are crops with considerable commercial value.

The date palm is grown in Asia Minor on a small scale, but it is in Arabia, Mesopotamia, and southern

Persia that this branch of agriculture becomes of prime importance. The fruit forms an important part of the diet of the nomadic peoples of these countries, and it is also exported to Europe. Magnificent date gardens exist along both sides of the Shat-el-Arab—the river formed by the union of the Tigris and Euphrates—and the irrigation of the gardens, harvesting of the crop, sorting and packing of the fruit for export, provide occupation for a large number of people. The outlets for this trade are Basra on the Shat-el-Arab, Koweit, at the point of intersection of caravan routes from the interior of Arabia, and Muscat on the Gulf of Oman. Koweit has also some trade in pearls.

Another special branch of agriculture is the growing of plants such as madder and indigo, that yield dye-stuffs. This is carried on for the support of the industry in which the people of the Near East and the Middle East excel—the manufacture of carpets and rugs, shawls, and silk fabrics. The Oriental carpets and rugs produced in these lands are famous throughout Europe and America, where they fetch very high prices. The designs differ according to locality, and the fabrics are named after the town or district in which they are made.

The well-known Turkey carpet is made in Asia Minor; and we may note that “Smyrna” rugs are made in America. Kermanshah and Shiraz in Persia have given their names to rugs with beautiful floral designs and many colours; Khiva and Bokhara rugs come from the Amu-Syr region; Herati rugs and Baluchistan rugs from the eastern part of the Iran plateau.

But sheep, goats, and camels are reared in such large numbers in all parts of the Near and Middle East, that there is a surplus of wool and hair for export. Mohair from Asia Minor, and Khorassan wool from Persia have been used in the Yorkshire textile industries for many years.

Whilst Khiva and Bokhara have had commercial relations mainly with Russia and India, the trade of the remaining countries in south-western Asia has been in recent times in the hands of Armenians, Arabs, and Greeks—peoples richly endowed with commercial qualities. Their fields of operation are respectively Persia, Irak and Arabia, and Asia Minor ; and their trade-routes focus upon Trebizond and Batum, Damascus and Beirut, and Smyrna.

Both Turan and Mesopotamia have railway connexions with Europe. The Syr valley line is an extension of the Russian system from Orenburg, and the Trans-Caspian Railway is a continuation of the line in Caucasia that terminates at Baku. The Baghdad Railway is connected with the Anatolian Railway which reaches the Bosphorus at Scutari. From Constantinople the Orient Express route carries the line of communication through Central Europe, so that with the exception of the break at the Bosphorus, there is a line from the North Sea to the Persian Gulf. In 1919 an agreement between the British and Persian Governments was concluded, under which the former will co-operate in building railways in Persia. A line will probably be carried from Basra along the coastal plain of Persia to Karachi.

At Aleppo the Baghdad Railway is connected with the French Syrian railways, and also with the line

carried through Damascus and southward through Palestine and the Arabian province Hejaz to Medina. This line is to be continued to Mecca.

(iii) **Siberia.** Until towards the end of the sixteenth century, the country now known as Siberia was occupied only by branches of the yellow race, chiefly Tartars whose chief town was Sibir (near the Irtish), after which the country was subsequently named.

Stimulated by the attempts of other European peoples to find short routes to the Far East, the Russians resolved to make explorations on their own account. The first step was the sending of troops over the border, and the capturing of Sibir in 1579. From that time Russian explorers continued to push eastward through the unknown country; but it was not until the middle of the seventeenth century that they reached the Pacific coast, and China.

Siberia resembles the interior of Canada in having an extreme and dry climate, and also in having three vegetation belts, tundra, taiga (forest), and steppe. The first of these is at present occupied by a few nomadic tribes, Samoyedes, Yakuts, and others who move southward for the winter; the chief commercial product of the tundras is fossil ivory. The forests contain a valuable reserve of timber, but so far their contribution to the world's commerce has consisted mainly of the pelts of the ermine, sable, and other fur-bearing animals. The steppe region has very rich soil, and it is being developed as an agricultural and dairy-farming land.

In addition Siberia possesses large stores of minerals, the greater part of which has not been worked. Extensive goldfields and coalfields exist in the valleys

of the Yenisei, Lena, and Amur ; the ores of silver, copper, and iron have been found in many places, especially in the basins of the Yenisei and Lena.

For a long time the value of Siberia as a field of emigration for Russian people was not fully appreciated. Convicts were sent to work in the mines of the east, and political offenders were exiled to Siberia, to begin life afresh either in the mines or on the land. It is estimated that during the nineteenth century some 20,000 people were sent to Siberia every year ; the system came to an end in the last year of the century.

Long before that date, however, Russians had begun to emigrate to Siberia, settling almost entirely in the southern part of the country, in the belt now traversed by the trans-continental railway. At the end of 1914 the population of Siberia was over ten millions, 80 per cent. being whites ; the number was very greatly increased during the Russian revolution of 1917.

The farming population is located mainly in the west, in the basin of the Ob-Irtish ; the market centres of this area, Omsk and Tomsk, had each a population of over 100,000 in 1913. Tobolsk, some distance farther north, is a town of 25,000. Omsk is the only one of the three on the main line, and being in the middle of an area that yields both wheat and dairy produce, it has become a most important trading town. Before the European War, several butter trains were dispatched westward from Omsk every week ; this particular trade owed its development to the enterprise of Danish agents. Tobolsk is likely to become important as commanding a waterway to the Kara Sea, a route which was shown to

be practicable by a British expedition in the summer of 1919.

Irkutsk, the capital of Eastern Siberia, is situated near Lake Baikal at the meeting-place of a number of routes. East and west there is the railway ; northward into the heart of the forest belt there is the navigable Angara ; whilst to the south-east there is the overland route via Urga and Kalgan to Peking. The city has over 100,000 inhabitants, and it has long had an important place in the tea and fur trades.

EXERCISES

Read *The Land of the Lamas*.

1. Give reasons for the importance of trade between Europe and Asia in olden times. Do the same reasons hold at the present day ?

2. Name parts of Asia, the commercial development of which has been delayed ; say what caused the delay, and describe the changes that have been made in modern times.

3. Write out a list of the commercial products of the Levant, Mesopotamia, and Trans-Caspia.

4. Construct a map of the railway connexions (existing and projected) between Europe and South-west Asia.

5. Name British-made articles which you would expect to find a market for in Palestine, Mesopotamia, and Trans-Caspia.

15. ASIA. PART II

THE AGRICULTURAL LANDS

The South-Eastern Plantation Region. When it was told in Venice that Portuguese ships had sailed to India, “ the whole city remained stupefied ”, said a Venetian historian, and “ held it as the worst news that had ever arrived ”. It was realized that the

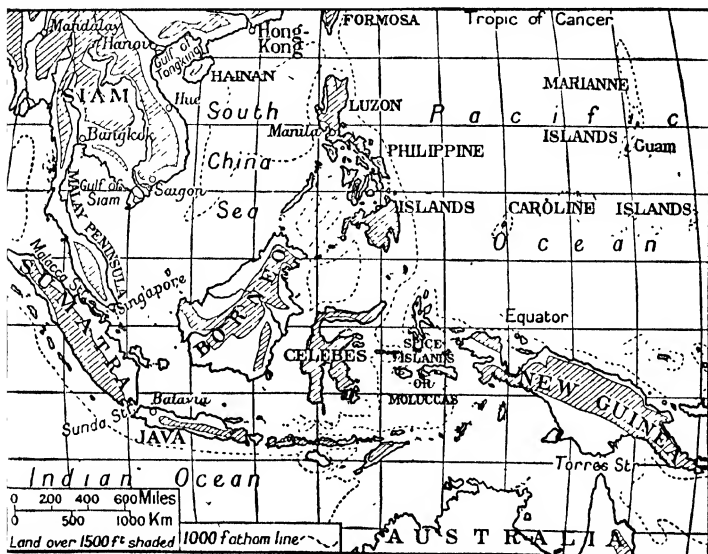
trade of Venice with the East by way of Egypt was seriously threatened. How well founded were the fears of the Venetians was speedily shown. In 1521 the Turks seized Egypt and closed the commercial route that Venice had depended upon for so long, and the spice trade passed entirely into the hands of the Portuguese. English, Dutch, and other peoples obtained their supplies of eastern products from Lisbon, and the use the Portuguese made of their monopoly may be judged from the price of pepper, which rose from 17 to 25 shillings a pound during the first twenty years of the sixteenth century. Eventually this had the effect of bringing other European traders into the spice trade.

The 20th April 1601 is a noteworthy date in the history of British commerce, for on that day the English East India Company, which had been formed a few months earlier, sent out a small fleet of vessels from Torbay, to open trade with the East Indies. When the English reached Sumatra, they found Dutch trading stations already in existence ; but they established a factory at Bantam in Java, and returned to England with cargoes of pepper.

There followed a period of bitter rivalry between the English, Dutch, and Portuguese traders. The Dutch built a town in Java which they named Batavia, and which is to-day one of the chief commercial centres in that part of the world. They drove the English out of Bantam and the Portuguese out of the Moluccas ; they massacred the British traders in Amboina, took possession of the Banda Islands, and gave a finish to their exploits by establishing trading stations in Ceylon. Thus the spice trade became the

monopoly of another European people ; the English East India Company turned their attention to India.

The Dutch have retained their supremacy in the East Indies, holding at present islands which have in all a population of about forty millions, whilst the



The Malay Archipelago.

Portuguese possess only a portion of Timor Island. The southern part of the Malay Peninsula (the Federated and Tributary Malay States), parts of Borneo and New Guinea (Papua), and some smaller islands, including the distant Cocos or Keeling group, are under British control. The Philippines belong to the United States of America.

Ceylon, though over 1,500 miles from Singapore

and close to India, resembles the East Indies in climate and productions. The island was largely under Dutch control until the beginning of the nineteenth century, when the British captured the Dutch coast settlements. The Cingalese ceded the interior to Britain in 1815.

Ceylon, the Malay States, and all the East Indian islands except some of the Philippines, lie within 10° of the Equator, and all have a hot damp climate which fosters the growth of vegetation like that of the Congo region, and has made the Malay States, Borneo and New Guinea, important rubber-producing lands. In 1913 the Malay States produced half the world's supply of rubber. The East Indian islands are also the source of the world's supply of sago, and Ceylon is the chief source of supply of coco-nuts for Britain. In fact these islands, together with the Malay Peninsula, form a great region of plantations—plantations of coco-nut palms, sago palms, para rubber, tea, coffee, sugar, sisal hemp, and tobacco; and about the position of the natives in the list of the world's workers there can be no doubt.

The region still yields those commodities which attracted traders in the Middle Ages. Nutmegs and cloves are grown in the Moluccas, pepper in the Malay Peninsula and adjacent islands, and all are exported through Singapore. Cinnamon is produced chiefly in Ceylon, where also there are important plantations of tea, cacao, coffee, and rubber. Java has a very large population engaged in the cultivation of sugar-cane, tobacco, rice, maize, and Soya beans. This island also produces the best quality of kapok, a fibre obtained from a species of silk-cotton tree, and much

used for stuffing upholstery. The Philippines produce Manila hemp (see p. 66) which is used in the manufacture of cordage and paper, but perhaps the most noteworthy agricultural enterprise carried out in this group is to be seen in the island of Luzon, where semi-civilized people have constructed a series of terraces over the whole of a mountain slope for the cultivation of rice.

The coco-nut palm, which flourishes best in a hot wet region, and near the sea, has received great attention in this region and also in the South Sea Islands, which are distributed over a wide area of the Pacific, eastward of New Guinea. The coco-nut is of great value to the islanders, providing food and drink, and fibres which can be made into mats and other articles. The chief commercial commodity it yields is "copra" (dried kernels), which is exported to Europe for the extraction of oil used in the manufacture of soap and margarine. The principal British possessions in the South Seas are : Tonga or Friendly Islands, Gilbert and Ellice Islands, Ocean Island, Fanning Island, British Solomon Islands, and New Hebrides.

The East Indies are not deficient in mineral wealth, though it is not fully worked. Gold and copper are mined in Sumatra, Borneo, and Papua, tin in Sumatra and Borneo, and the tin workings of Perak in the Malay Peninsula are the most important in the world ; petroleum is obtained in Java, Sumatra, Borneo, and Papua. Far away to the east there is Nauru Island, annexed by the Germans in 1888 and surrendered to H.M. Australian Ship *Melbourne* in 1914, and interesting as possessing the largest reserve of phosphates in

the world. This commodity is used for the manufacture of artificial fertilizers, which are in great demand in the adjacent lands, Australia and New Zealand, as well as in European countries.

Somewhat remote from the East Indies, but resembling them more or less in climate and productions, are various groups of small islands in the Indian Ocean that form part of the British Empire. Amongst these are Mauritius (producing sugar and fibre) and its dependencies Rodrigues, and the Chagos group (producing coco-nut oil); the Seychelles (copra, vanilla, and coco-nut oil); the Nicobars (coco-nuts), and the Andamans (timber, worked by convict labour).

The Indian Empire. The English East India Company established a trading station at Surat in 1612, and, after the disasters in the East Indies, built warehouses at Fort St. George (Madras), Fort William (Calcutta), and Bombay. Portuguese settlements were already in existence on the Malabar coast, and the French East India Company had a settlement at Pondicherri.

For several reasons the Portuguese speedily lost ground, and at the present time they hold only three stations, chief of which is Goa. The French, however, made an attempt to gain possession of the whole of the southern portion of the country. That the English Company was not driven out of India was due mainly to the military skill of Robert Clive. The French still hold five towns, Pondicherri being the most important.

The English East India Company, having become dominant, governed India—not very successfully—

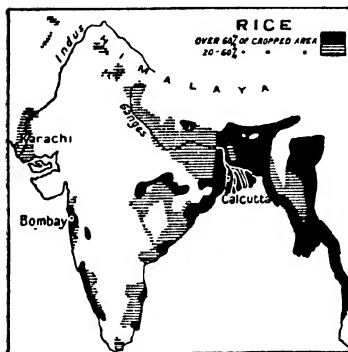
until the time of the Mutiny (1857). After that India became part of the British Empire ; but the Himalayan states, Nepal and Bhutan, are independent, whilst Kashmir, Rajputana, Haidarabad, and other states are governed by native princes under British authority.

The Himalayas form a huge barrier along the north of India, cut through by two great rivers, the Indus and the Brahmaputra, both of which rise on the plateau of Tibet and flow in opposite directions. The mountain system is continued southward through Burma as a series of parallel ranges, between two of which lies the long fertile valley of the Irawadi. Immediately south of the Himalayas the Indo-Gangetic plain stretches across the country from the Suliman Mountains to Burma ; it includes a large unproductive area called the Thar Desert, but the eastern portion is one of the most fruitful regions in India. South of the plain the land rises in the Deccan plateau, which fills the rest of India, sloping generally eastward from the lofty Western Ghats.

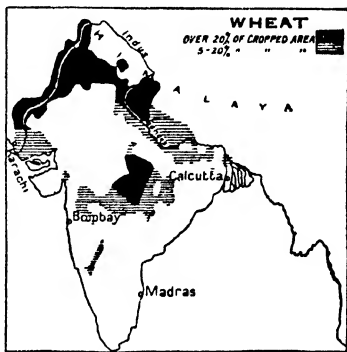
Life and work in India are powerfully influenced by physical and climatic factors. The melting snows of the Himalayas, and the deluge of rain that descends upon those mountains during the hot season, contribute huge volumes of water to the Ganges and Irawadi, and those rivers are therefore subject to floods. In the case of the Ganges particularly, successive inundations have deposited a thick layer of rich soil on each side of the river, giving the plain its great food-producing qualities. But rainfall is distributed very unevenly over India ; in the Punjab and the Deccan success in agriculture is attained

only by careful attention to irrigation. Elaborate systems of canals have been constructed in the basins of the Indus, the Upper Ganges, and the Krishna.

About three-quarters of the people of India are engaged in some branch of agricultural work ; the crops raised vary with locality. Rice is grown over large areas in the Ganges basin below Benares, in the



Distribution of Rice in India.



Distribution of Wheat in India.

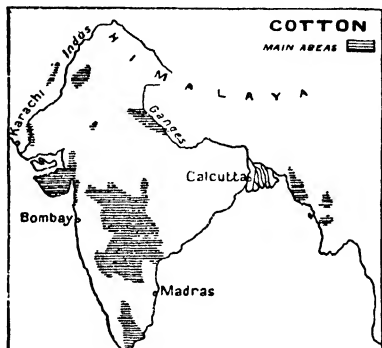
valleys of the Brahmaputra and Irawadi, and all along the shorelands of Burma.

It is said that an acre of rice land will support four times as many people as an acre of wheat land ; but the yield of wheat varies greatly according to treatment of the land ; in any case the advantage certainly lies with rice. Two crops are raised during the year, the first being sown in April, and the main crop after the July floods. Thus the Ganges region supports a very large population. The population of Burma is not so dense, and there is a surplus of rice

for export ; British imported rice comes mainly from this region through Rangoon.

Rice is also grown to some extent in the valleys of the Deccan rivers, and on the wet western shore-land of the plateau. On the Deccan itself, and generally in the dry regions of India, millet takes the place of rice ; it is grown entirely as native food. Oil seeds such as mustard, sesamum, and linseed are grown for the export trade in many parts of the Deccan, and plantations of sugar-cane are distributed over the Deccan and the Ganges plain.

The Punjab (Land of Five Rivers) has been made into one of the most productive areas in the country.



Distribution of Cotton in India.

Wheat, barley, oats, and rye are grown during the cool season ; maize, millet, and cotton in the hot season. Much of the Punjab wheat is exported through Karachi.

From the point of view of the British commercial world the important crops are tea, jute, and cotton. Tea plantations are most numerous in Assam and Bengal, where the rainfall is heavy during the hot season, but the plant is cultivated also in the Punjab, Upper Burma, Travancore, and other parts. Jute requires abundance of heat and moisture, and is therefore almost entirely restricted to the eastern part

of the great plain, where jute fields are common enough amongst the rice-fields. Cotton is grown on a big scale in four areas, the basins of the Indus and Upper Ganges, the Gujarat peninsula, and the central part of the Deccan. The outlets for these products are Karachi, Surat, and Bombay for cotton, Calcutta for jute and tea.

Ramie, a fibre of less commercial importance than cotton or jute, is obtained from the stem of a plant belonging to the nettle family introduced into India from China. The fibre has a fine silky appearance; it is exceptionally strong, and it is used for the manufacture of rugs and carpets and as an adulterant of silk.

Burma, the Himalayas, and the Western Ghats have a climate that is very favourable to the growth of trees, and the mountains are clothed with luxuriant forests. The total area of forested land is 145,000 square miles. The government pays careful attention to afforestation and timber cutting. The most valuable timber for commerce—teak—comes mainly from Burma and the Western Ghats; to the natives, however, the products of the bamboo forests of Burma and Assam are of greater value.

The opium poppy, grown in the Ganges valley and Central India, indigo, in Bengal and the Punjab, tobacco in Burma and Madras are other crops, raised partly for home consumption and partly for export.

Though India is essentially an agricultural country, the number of people engaged in industries is given as 35 millions. This seems rather large until it is remembered that the number engaged in agricultural and pastoral work is 225 millions, and that the total

population is 319 millions. It is this huge population that makes food raising so important, and that makes the amount of land available for pasturage comparatively small; still, pastoral work does lead to some export trade in hides and skins.

Except in Bombay, Madras, and Calcutta, where European machinery has been erected for the manufacture of cotton and jute, the industrial workers of India produce mainly "hand-made" goods; for these they have been famous for many centuries. Muslins from Dacca, gunny-bags from villages in Bengal, metal work and silks from Benares, shawls and carpets from many towns and villages, and especially from Amritsar, Lahore, and Multan in the north-west, find their way into the markets of Europe, but with the exception of carpets and rugs, they have diminished considerably in commercial value.

EXERCISES

Read *Peoples and Problems of India* (Home University Library).

1. Account for the great difference between the mode of life and activities of the people of South-west and South-east Asia.

2. Write out a list of the commercial commodities of the East Indies.

3. Explain the value of the coco-nut to the South Sea islanders and to Europeans.

4. What are the food-crops and commercial products of India and Burma?

5. Write a short essay on the Industries of India.

6. Mark on a map the trade-routes from England to India.

7. Write out a list of British manufactured articles likely to find a market in India.

16. ASIA. PART III

THE FAR EAST

A NEW world is arising in the Far East ; its name is China. Shut off from free communication with the western world by mountains and deserts, China remained an almost unknown land until Europe entered upon the Age of Ocean Navigation. The East India Companies formed in Europe established trading relations with China, but their activities were severely restricted by the Chinese authorities ; and though one of the most ancient, the Chinese appear to have been the most unprogressive of civilized peoples.

Yet the Chinese seem to have almost every natural advantage for becoming a great commercial people. The merchants have business qualities of high order ; the people, over 300 millions in number, are frugal and industrious ; the Yangtse-kiang is navigable for over 1,000 miles ; the soil of the valleys and plains is extremely rich ; the variation in climate from cold to tropical gives a wide range in crops ; and the country is exceptionally rich in minerals.

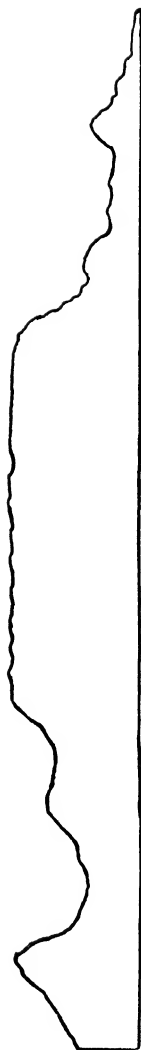
Coal exists in nearly all the eighteen provinces, and it is said that the coalfields of Shansi could meet the world's needs for hundreds of years. The iron-ore region of Ta-yeh, and the copper deposits of Yunnan and Szechwan are considered to be the richest in the world. In addition there are plentiful supplies of tin, antimony, lead, petroleum, and a considerable amount of gold, silver, and quicksilver. Until quite

recent years these mineral stores have been almost untouched; though Marco Polo found that coal was used as fuel when its value was unknown in Europe.

In the past, China, with a huge population having little intercourse with the rest of the world, was of necessity an agricultural country, and the bulk of the people are still engaged in agriculture. The land is cultivated very carefully, though with primitive implements. The crops vary according to climate and the character of the land, but it may be said that generally the food-crops of the north are wheat, barley, millet, pease, and beans, those of the south being rice, maize, and sugar-cane. Rice is cultivated in all parts of the plain of the Hwang-ho, and maize on the coastal plain generally.

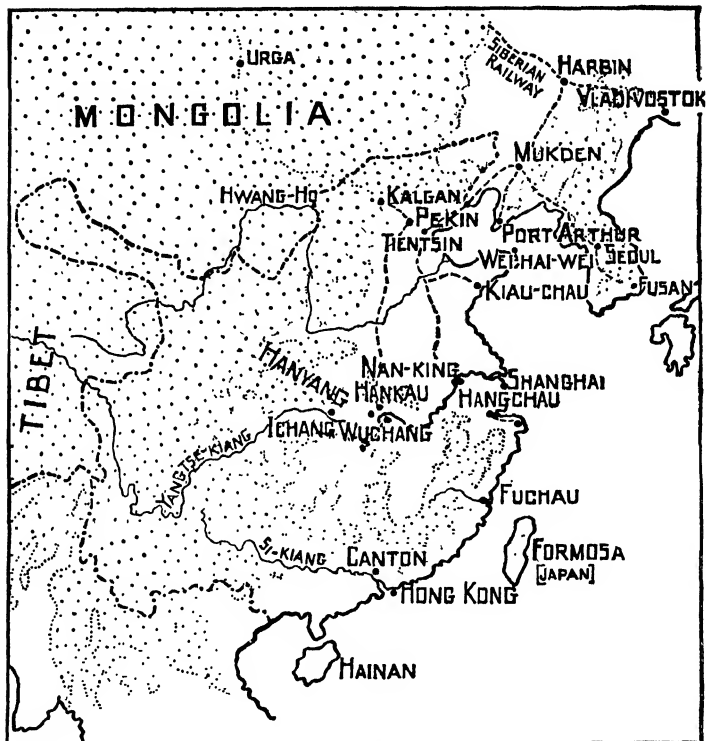
There is probably no more wonderful agricultural region in the world than the basin of the

Tian Shan Mts. Jin-Kiang Kwen-lun Mts. Plateau of Tibet Sze-chwan Kwei-chau Kiang-si Kwang Nan-ling Tung Mts.



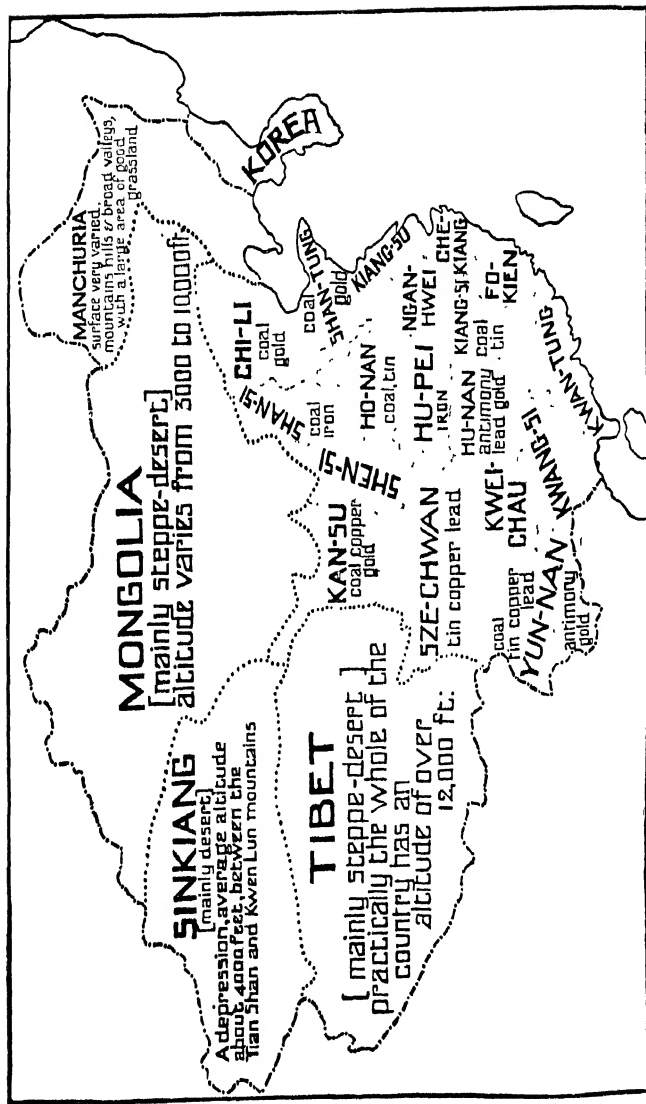
Diagrammatic section—north-west to south-east—across the southern part of China and its dependencies.

Yangtse-kiang. On both sides of the main stream, from the coast to the densely-peopled province of



China, showing the large proportion of land over 2000 ft. in altitude.

Szechwan which has been called the granary of China, there is an endless succession of rice-fields, cotton-fields, and tea-plantations. Large areas are also devoted to the mulberry cultivation, for silk is



China (showing the 18 provinces) and its dependencies—Manchuria, Mongolia, Sin-Kiang, and Tibet.

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now, as it has been for thousands of years, a special Chinese product.

Tea plantations are most numerous in the hilly region south of the Yangtse in the provinces of Che-kiang, Fo-kien, and Kiang-si, and there is another large tea-producing area in the basin of the Si-kiang (Kwan-tung province). From these regions come the teas known as Souchong, Orange Pekoe, and Oolong. Fu-chau, in Fo-kien, was the great tea port in the days of the China clippers; Shanghai, near the mouth of the Yangtse, and Canton on the Si-kiang, are other outlets. The export of China tea to Britain declined greatly when India and Ceylon entered the market.

The Yangtse-kiang, the most navigable river, flowing through the most productive region, has naturally become the chief commercial highway. Han-kau, situated far up the river, but easily reached by ocean-going vessels, is a very busy river port, connected by railway with Peking.

This fact alone reminds us that the old order of things in China is passing away, and a new world is arising. The first permanent railway was opened in 1887; now there are 6,000 miles of railway, and thousands more are either projected or under construction. The first telegraph line, between Shanghai and Tientsin, began working in 1882; now there are 40,000 miles of line and many wireless stations, worked almost entirely by Chinese. The Chinese post office was officially established in 1896, and it dealt with 10 million articles in the first year; in 1914 the number had become 700 millions.

What China is to-day is nothing to what her huge natural resources and almost unlimited reserve of

labour may enable her to become in another half-century. The country has just entered upon an age of industrial development. Textile mills have been erected in Shanghai, Canton, and other towns, and Chinese cotton goods have appeared in European markets. Large steel works at Hanyang managed by a Chinese graduate of Sheffield University are turning out 300 steel rails per day, and still larger works are being erected near the iron-mines of Ta-yeh. Shanghai gives promise of becoming the chief ship-building centre on the Pacific ; its yards have produced several 10,000 ton vessels for the United States.

At the same time the government is endeavouring to improve agriculture. During the last ten years farms have been established near Peking in connexion with the growing of rice, maize, millet, and Soya beans, and in Chihli, Kiangsu, and Hupeh for investigations in cotton-growing and sugar production. Millions of mulberry trees have been distributed to farmers in Shantung, Shansi, and Chihli with a view to the further development of the ancient industry of silk production. An Irrigation Bureau has been established largely for the purpose of draining extensive areas in Shantung and Chihli which are frequently flooded by the Hwang-ho.

In 1913 the government began to give special attention to pastoral work with a view to increasing the export of skins and wool. Ranches for cattle and sheep were established near Kalgan in 1913, and near Peking in the following year.

Roads in China are generally very poor, but there has been an elaborate system of canals in existence for several thousand years. The Grand Canal, which

connects Tientsin with Ning-po, and one of the greatest works of its kind in the world, was begun in the sixth century and completed in the thirteenth. For many years it has been neglected, but dredging operations have been started.

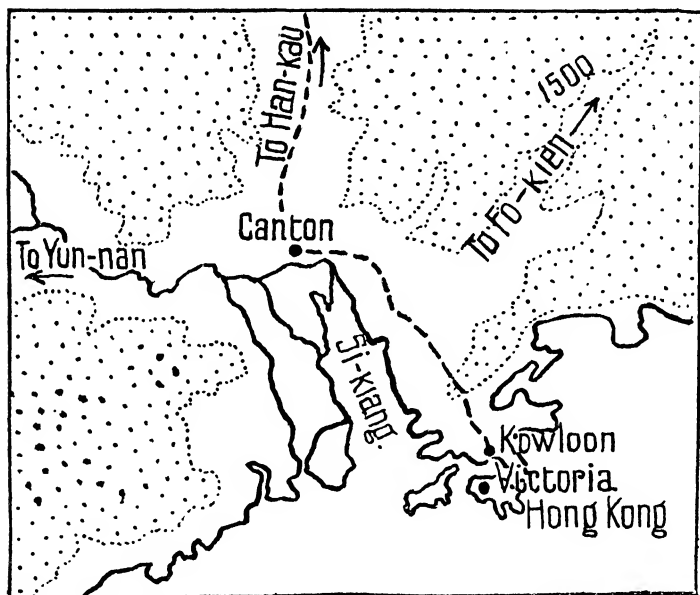
The Chinese have undoubtedly entered upon a new era, and the development of the resources of their country causes a great demand for the machinery, implements, and fabrics of other lands. Britain formerly had the greatest share of Chinese foreign trade, but during the European War a large portion passed to Japan.

The British Crown Colony of Hong Kong consists of a number of islands at the mouth of the Si-kiang, and a portion of the mainland—Kowloon. The colony has a population of half a million Chinese (60,000 of whom live on boats), and 14,000 Europeans, carrying on such industries as sugar-refining, tin-refining—the ore for which comes from the distant province of Yun-nan—and ship-repairing.

But the importance to Britain of Hong Kong arises mainly from its situation at the entrance to what is at present one of the world's greatest markets for manufactured goods ; about one-third of the foreign trade of China passes through Hong Kong. The capital, Victoria, extends for some five miles along the shores of the finest harbour in the Far East. Kowloon has a railway connexion with the city of Canton ; in the near future the Canton-Hankau line will be completed, and Kowloon will then have rail communication through the heart of China to Peking.

French Indo-China and Siam. French Indo-China

and Siam, which lie to the south of China, are agricultural states with flat and marshy coastlands that produce large crops of rice. Teak from the forests of the interior, and spices from the plains, are other



Map showing situation of Hong-Kong.

important commercial products. The chief commercial centres are Haiphong (Indo-China), which, non-existent in 1880, now has a population of 75,000, and a first-class harbour, and Bangkok on the Menam (Siam).

Japan. The Japanese Empire includes a great number of islands, chief of which are Yezo, Nippon, Kiushiu, and Formosa, and the peninsula of Korea

which became part of the empire in 1910. Both the islands and the peninsula are mountainous, and the highlands generally are clothed with forests of typical British trees—oak, elm, chestnut, and pine—whilst bamboo forests and plantations of wax-trees are a feature of Nippon and Kiushiu, and camphor plantations of Formosa.

The valleys and plains of the islands and the west coast plain of Korea are highly cultivated. Wheat is grown on a small scale, but rice, the staple Japanese food, is grown extensively in Kiushiu, Skikoku, southern Nippon, and Korea. The southern part of Nippon, Kiushiu, and Korea have a climate that makes it possible to grow Mediterranean fruits, as well as tobacco and cotton; sugar-cane and tea are produced in Nippon and Kiushiu.

But the change which is taking place in China started in Japan about the middle of last century, and the result is seen in the development of Japanese industries and an enormous increase in over-seas trade; since the end of the nineteenth century Japanese trade has increased by 2,000 per cent. Fifty years ago manufactured articles exported from Japan consisted chiefly of such trifles as fans, lacquer, curios, and porcelain; at the present day there are in addition "raw" silk, silk and cotton materials, copper, matches, straw-plait, sugar, coal, and, during the European War, rifles and other war material.

Silk is the most important of Japanese commercial commodities, and the material known as "Jap silk" in English drapers' shops is manufactured and sold at a price no other nation can approach. It is sold over the counter as imported from Japan, but many

British and French manufacturers import Jap silk for further treatment.

The development of textile industries has brought Japan into the cotton market as a rival of Britain for the trade with India and China, and the European War gave the Japanese an opportunity to extend their trade with these countries which they did not fail to seize.

Foreign commerce has transformed Yokohama from a somewhat insignificant village to a great commercial centre of nearly half a million inhabitants. The port is built on the shores of Yedo Bay in Nippon, and is equipped with all the aids to handling cargo used in western ports. An electric railway connects Yokohama with Tokio, where the head office of the Nippon Yusen Kiushiu line is situated, and the port has steamship connexions with all Pacific ports of note, with Australia, India, and Europe.

Next in importance come Osaka, the outlet for the silks of Kyoto—once the capital, now the chief industrial town of Japan—and Nagasaki on the island of Kiushiu, with large shipbuilding yards and export trade in coal.

The industrialization of Japan has had the effect of withdrawing many people from agricultural work, and the result is seen in the steady increase in the amount of imported food-stuffs. Even the home-grown crops of rice are insufficient for the population ; in addition the imports include large quantities of wheat flour and condensed milk, as well as raw cotton.

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EXERCISES

1. Read *Japan of the Japanese*.
2. Give reasons why China, though inhabited by a civilized people thousands of years ago, is still mainly a land of primary producers.
3. Mention some old-established industries of China, and estimate their importance at the present day.
4. Name some new industrial centres in China, and say what articles are manufactured at each place.
5. What advantages does China possess for industrial development ?
6. For what reason could it be said that the revolution in Japan in the middle of the nineteenth century was an advantage to Britain during the European War ?
7. Make out lists of the commercial commodities of China and Japan.
8. Mark on an outline map of the world all the routes from England to the Far East.

17. EUROPE

REGIONS AND PRIMARY PRODUCTIONS

EUROPE, the western extremity of the huge land area called Eurasia, is remarkable amongst the continents of the world for its lengthy coastline, its peninsulas, and land-locked seas—features which have exercised a beneficent influence upon the climate of the continent and upon the activities and progress of its inhabitants.

These features have their origin in the irregularity of the highlands. In the north there is the vast detached plateau of Scandinavia, built of pre-Cambrian rocks, and a fragment of what was once a still greater plateau including the Scottish Highlands and north-western Ireland.

East and south-east of the Scandinavian plateau lies the broad part of the great lowland plain, which in the neighbourhood of the Caspian Sea is actually below the ocean level, and which is continued westward through Germany and the adjacent lands to the Atlantic seaboard.

South of the plain there is a complicated highland region consisting of plateaux of ancient rocks such as the Meseta of Spain, Central France, Bohemia, and a number of mountain ranges formed by the folding of much more recent rocks. The chief mountain system is the Alps, a great uplift that has been carved by rivers, glaciers, and other agents on a most elaborate scale. Prolongations of this system, the Apennines, and the Dinaric Alps and Pindus Mountains, give rise to the great peninsulas that penetrate the Mediterranean Sea.

Farther east the Carpathians, rising gradually from the neighbourhood of Pressburg on the Danube, describe a huge D-shaped curve and approach the Danube again as the Transylvanian Alps at the Iron Gate, 500 miles lower down. On the other side of the Iron Gate the Balkan ridge is seen, curving gradually to the east and forming the watershed of the lower Danube.

The mountain systems named above enclose in the basin of the Po, the plain of Hungary (Middle Danube), and the plain of Rumania (Lower Danube) lowland areas of remarkable fertility, built largely of sediment removed by the rivers from the adjacent mountain slopes.

The remaining great mountain ranges are the Pyrenees and the Caucasus, alike in being more

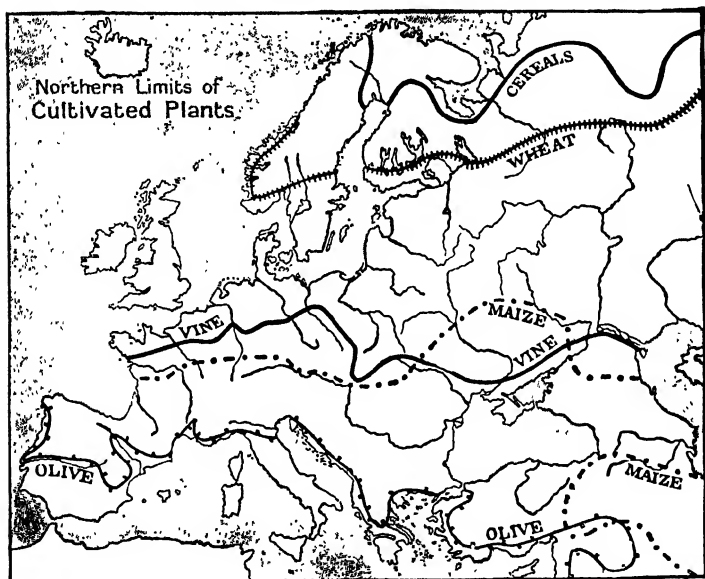
effective as barriers than the Alps, the Sierra Nevada, which presents a steeply-terraced front to the south coast of Spain, the Juras, the Vosges, and various German ranges which give a very rugged aspect to the surface of Central Europe.

It is possible to divide Europe into a large number of small natural regions, but guided by broad climatic differences we may regard the continent as consisting of three large regions ; they are further distinguished by type of people and human activities.

These regions are (1) The Mediterranean, with long dry summers and cool rainy winters, occupied by Latin peoples in the west, by Greeks and Turks in the east ; (2) North-western Europe, a region with a maritime climate, and extending from Ushant to North Cape. The winter is mild, summer generally warm, and rain falls at all seasons. North-western Europe is occupied mainly by people of the Teutonic stock. (3) The Continental Region, characterized by extremes of temperature and generally low rainfall, and occupied *mainly* by Slavonic people ; the Magyars of Hungary, the Finns, and the inhabitants of the far north belong to the yellow race.

With natural vegetation as a guide the continental region may be divided into four minor regions, viz. : (a) the deciduous forest region, extending northward to the latitude of the Gulf of Finland and eastward to the borders of (b) the steppe region of south-eastern Russia ; (c) the coniferous forest region, extending across the continent south of (d) the tundra region, which borders the Arctic Ocean. The deciduous forest region is mostly cleared except in high-land areas.

The Mediterranean Region. There are industrial areas around Bilbao and Barcelona in Spain, and also in the north of Italy and certain other places, but the Mediterranean region is on the whole a region of



Map showing the Northern Limits of some important cultivated plants.

primary producers, whose activities depend very largely upon the configuration of the country. Pastoral work is followed in such highland areas as the Meseta of Spain, which is particularly famous as the home of the merino sheep, on the Apennines of Italy, and in almost all parts of Yugo-Slavia. The bulk of the people of the lowlands are engaged in

the growing of fruit and grain, and generally irrigation works are necessary.

Grapes, oranges, lemons, olives, figs, pomegranates, peaches, apricots, nuts, and almonds are typical products of the Mediterranean region; this applies to Algeria, which is an integral part of France, and to the Levant shorelands, as much as to the European countries. Olive oil and fruit are freely consumed by the people in all Mediterranean lands, but there is a large surplus for export to northern countries.

Britain is a particularly great buyer of these products, importing in 1918, for example, olive oil to the value of half a million pounds and fruit to the value of over ten million from Italy and Spain; the oranges from Spain alone were valued at £5,450,000. It is interesting to note also that during the same year two million pounds' worth of onions were exported from Spain to Britain.

Malaga, Almeria, and Valencia in Spain, Corinth in Greece, Smyrna in Asia Minor, and Jaffa in Palestine are so well known as fruit ports that their names have been given to the raisins, oranges, currants, and figs shipped from their docks, whilst Seville, an inland town on the Guadalquivir, has given its name to the bitter orange used in Britain for marmalade and in Holland for the making of the liqueur curaoa.

Other plants cultivated extensively in the Mediterranean region are the mulberry, hemp, esparto grass, and roses. The mulberry is grown generally throughout the region, its leaf being the natural food of the silk-worm; raw silk is produced and manufactured in all Mediterranean lands, but especially in Italy

and France. Hemp is grown in Italy and exported in considerable quantity to England. Esparto grass (used in the making of paper) is grown in Algeria and Spain ; from the latter a great deal is sent to England. Roses have been grown on a large scale in Bulgaria for many years for use in the manufacture of attar of roses. The closing of the three great perfumery markets of the world—Paris, London, and New York—during the European War, was a severe blow to the Bulgarian industry ; since 1914 some six thousand acres of rose-gardens have been converted into tobacco plantations.

Mineral-producing areas are not numerous in the Mediterranean region, but there are some valuable deposits of iron-ore, copper-ore, and quicksilver in Spain. Hematite is worked in the Cantabrians, partly to supply the furnaces of Santander and Oviedo, and partly for export to South Wales and elsewhere through the ports of Bilbao and Santander. Iron-ore is worked also in the Sierra Nevada mountains and exported from Almeria. Copper-ore is obtained from the well-known Rio Tinto mines in Andalusia, and exported through Huelva.

Portugal is not so rich in minerals as Spain, but it is the chief country in Europe for the production of wolfram—tungstate of iron and manganese—which has now special value for the making of steel and electric-lamp filaments.

Italy has apparently still smaller stores of mineral wealth ; but the volcanic areas of Vesuvius and Etna yield boracic acid and sulphur which are exported from Naples and Catania. Very fine marble is worked at Carrara, iron on the islands of Elba and Sardinia.

Cyprus, the largest British possession in the Medi-

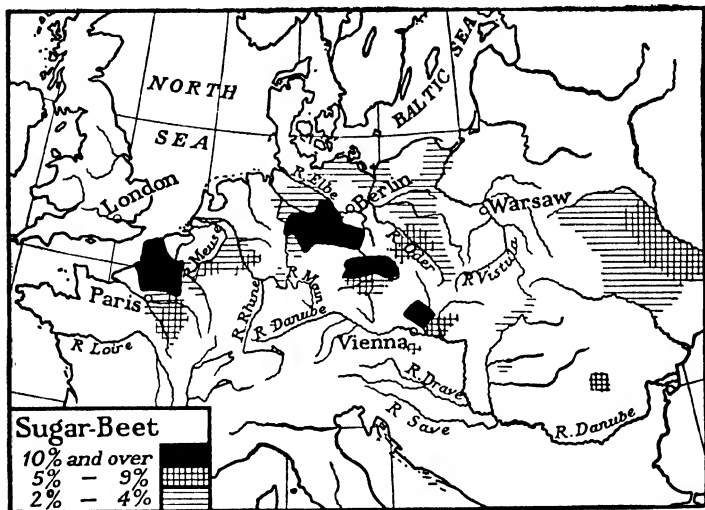
terranean, was of some importance in the Middle Ages as a silk-manufacturing area. At the present day its people are engaged mainly in agriculture and rearing of silk-worms. The exports consist of cotton, wine, raisins, the fruit of the carob (locust-tree), and cocoons. Malta, important to Britain as a naval base, has a population employed chiefly in agriculture and shipping; about 8,000 women and girls are engaged in lace-making.

North-Western and Continental Europe. The agricultural products of these two regions may conveniently be considered together. In proceeding from the Mediterranean region northward, the most noteworthy feature is the change in crops according to climate; the change is in fact so evident that it has been found possible to indicate on vegetation maps of Europe the northern limits of cultivation of the olive, vine, wheat, &c. (see p. 181).

The vine gives place to the apple and other English fruits even in the north of France, though it is grown extensively in Central Europe (Germany, Hungary) and in the south of Russia. Maize, a crop of some importance in the Mediterranean region, and not grown at all in North-western Europe, is raised in the lands around the Black Sea. Wheat is grown on a large scale in France, Hungary, Rumania, and Ukraine, and on a small scale in England. Elsewhere this crop is of minor importance, though the "wheat-limit" is so far north as Oslo and Leningrad. Oats and rye are the prevailing cereals throughout the greater part of the regions we are considering, and rye is the staple food of the peasants and work-people of Russia and Germany. Little rye is grown in Britain,

but oats is the chief grain crop in Scotland and the greater part of England. The potato is grown extensively in every country.

Of the crops named above, few are important in international trade, the explanation being that the



Map showing the relative importance of Sugar-Beet cultivation in Central Europe.

total yield is required for the home markets. There are, however, certain exceptions ; the potato is grown in the Channel Isles on a scale large enough to allow of export to England, and wheat is grown for export in Hungary, Rumania, and Ukraine.

The sugar-beet is, however, a very important commercial plant. It is grown extensively in France, Belgium, the Netherlands, Germany, Austria, Poland,

Czecho-Slovakia, and Ukraine, in all of which the manufacture of sugar is an important industry. The cultivation of sugar-beet received little attention in England until supplies of sugar were reduced by the European War. Then steps were taken to grow beet on a commercial scale in the Midlands and parts of Scotland, under the auspices of the British Sugar Beet Growers' Society.

Another important crop is flax, raised in many parts of Europe, two of which are of special importance. The first of these is a broad belt including the Baltic republics and the upper part of the basin of the Volga—a region that supplies most of the flax required in the Belgian factories; the second is the region between the Seine and the Zuider Zee, which supplies the fine flax used in the Belfast mills. In part of this area, especially in the Haarlem district, many people are engaged in horticultural work, and they export bulbs and flowers in large quantities.

Pastoral work, the second great branch of primary production, provides employment for large numbers of people in certain countries, more especially those with a considerable amount of land which, by reason of its altitude or the character of its soil, is not very suitable for crop-raising; in several cases, however, land of the best type is used as pasture for dairy cows. The chief pastoral lands are Switzerland, Holland, Denmark, Scandinavia, Yugo-Slavia, Hungary, and Russia; and in the first four there are flourishing dairy-farming industries worked usually on the co-operative system. In the British Isles pastoral work is important in all hilly regions, and dairy-farming in Ireland.

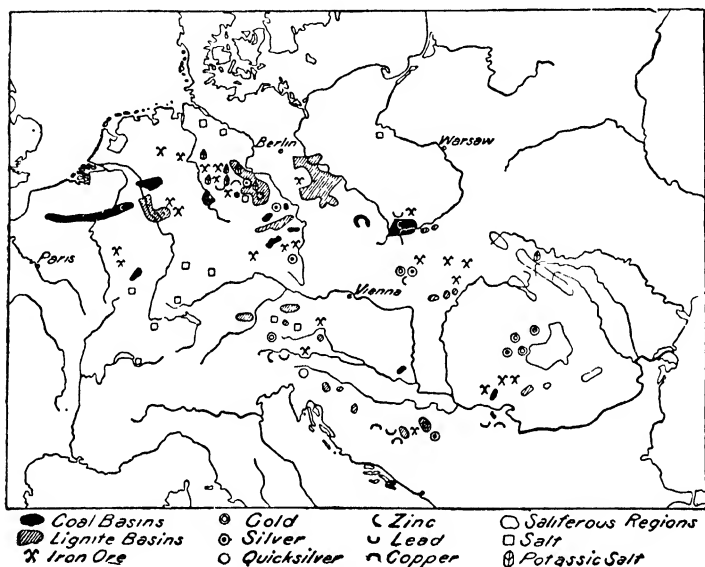
North-western Europe consists of a number of countries ranged round a sea which is remarkably free from ice; even Hammerfest, far within the Arctic Circle, has a harbour that is always open. Moreover, the North Sea ranks as one of the two greatest fishing-grounds in the world, being well stocked with cod, haddock, herring, and other fish well known in British markets. It is not surprising, then, that fishing is an occupation of considerable importance in North-west Europe.

Recent returns give the numbers of fishermen as 18,000 in the Netherlands, 19,000 in Denmark, over 30,000 in Germany—though many of these are engaged in inland waters—93,000 in Norway, and 120,000 in the United Kingdom. On the Continent Norway evidently has the greatest fishing industry, and in addition to the men engaged upon the sea, large numbers of people are employed ashore, drying and salting fish, extracting oil, and converting refuse into guano.

MINERALS. It is possible that originally the carboniferous rocks extended eastward from England in a broad belt several hundred miles wide, through the north of France, Belgium, Germany, and Russia. Whether this be so or not, the chief European coal-fields lie within that belt. But there is a large number of very small coal basins in Central France, the chief being those near St. Etienne and Creuzot, a bigger coalfield around Oviedo in the north of Spain, and one in the valley of the Gaudalquivir.

Proceeding from west to east in the northern belt, there is first the Franco-Belgian coalfield, which suffered greatly during the European War. The

mines in the neighbourhood of Lens and Drocourt were destroyed by the Germans, and under the Peace Treaty the French are to receive in reparation 20 million tons of coal annually for five years; in



The Minerals of Central Europe.

addition the Saar coal basin adjoining the iron-fields of Lorraine is to be under French control for fifteen years from the date of the treaty.

In Germany there is the important Ruhr coalfield in the basin of the Rhine, the Saxony coalfield in the basin of the Elbe, and the Silesian coalfield in the basin of the Oder. The last of these extends into three countries, Germany, Czecho-Slovakia, and Poland;

and in the same area there are large deposits of zinc and lead.

Russia possesses three very large coalfields, one in the middle of the country, around Tula, another in the Donetz basin of the south, and the third in the Ural region east of Perm.

In addition to these deposits of coal of "carboniferous age", there are in Germany, Czecho-Slovakia, Austria, and Russia large areas of lignite or brown coal, formed in a period much later than the carboniferous age, and generally of small value for industrial purposes, but useful as domestic fuel.

It should also be noted that there are valuable coalfields in the Spitsbergen archipelago, within 600 miles of the North Pole, which are being worked by Norwegian and British companies.

Iron-ore is found in all the European coal-yielding areas, and there are some particularly rich deposits in French territory—in Lorraine and the district near Nancy—and in Luxemburg. There are also very valuable stores of magnetic iron-ore in Sweden, in the iron mountain of Gellivara (Lapland), and around Fahlun north of Lake Maelar.

Each of the three mountain regions, the Carpathians, the Caucasus, and the Urals, is very rich in minerals, and each awaits full development. Copper and iron-ore are abundant in each area; the Carpathians and Caucasus regions have large quantities of petroleum, worked around Drohobycz and Baku respectively; Perm, in the Ural region, supplies the greater part of the world's platinum; Wielickza, in the Polish Carpathians, is the centre of an area with vast deposits of rock salt.

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EXERCISES

1. Make out lists of the chief pastoral countries, agricultural countries, and mineral-producing countries of Europe.
2. Write out a list of the commercial commodities of the Mediterranean region, and give the names of the countries in which each is produced.
3. Give a short account of the occupations of the people of Norway, Sweden, and Denmark.
4. What is meant by the "vine-limit" and the "wheat-limit"? Trace the course of each line.
5. Write a short essay on the Fisheries of North-west Europe.

18. EUROPEAN INDUSTRIES. PART I

WHILST certain European lands, including Russia and nearly all those in the Mediterranean region, are occupied by peoples whose activities are directed mainly to primary production, industries of one kind or another exist in every country. But the industries that have considerable commercial value are at present located in either (*a*) that small group of countries richly endowed with coal and iron, or (*b*) areas which, while possessing no coal, have ample supplies of water-power. In the first group come north-eastern France, Belgium, Germany, Poland, and the north-west of Czecho-Slovakia (Bohemia); in the second group are Scandinavia, Switzerland, and northern Italy.

It is a noteworthy fact that the Mediterranean region, now peopled mainly by primary producers, was formerly—in the early centuries of the Christian

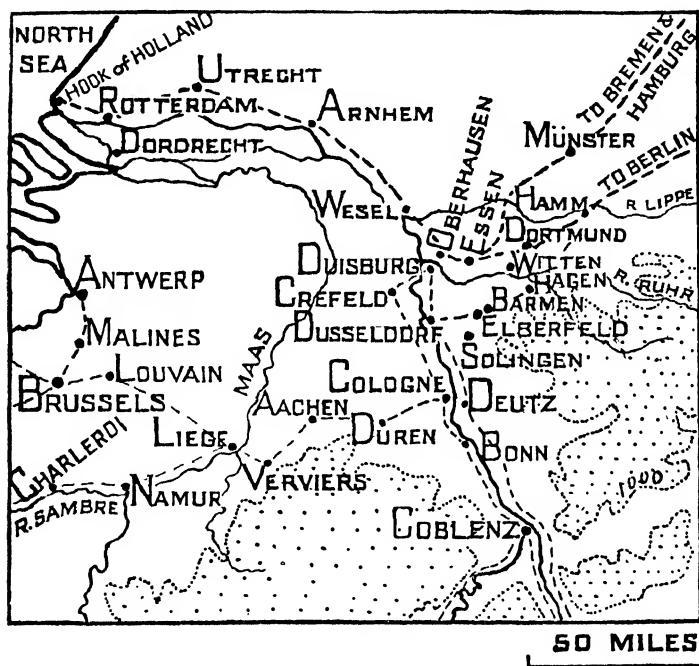
era—one of the chief manufacturing regions in the world. All the best weavers of wool, cotton, and silk, the most skilled workers in glass, leather, wood, gold, and iron, clever lace-makers, embroiderers, and dyers, were to be found in the cities of Italy, Asia Minor, and Egypt; even at the present day Mediterranean workers in some of these industries have a great reputation. But the times have changed, and most of the great industries are located north of the European mountain system.

It is the activities of the industrial workers of Europe that we have now to consider, taking each group of industries in turn.

Textile Industries. (i) **SILK.** France and Italy rank with China, Japan, and India as the great silk manufacturing countries of the world. The industry was introduced into the Mediterranean region some 2,000 years ago, but for several centuries raw material could be obtained only from the East. In the sixth century, however, some silk-worm eggs were smuggled into Constantinople, and in course of time silk-worms were distributed from this centre throughout the Mediterranean region.

At the present day the manufacture of silk is carried on to some extent in every Mediterranean country, the most important centres being in France and Italy. The French workers at Lyons and Grenoble have long held a high place as manufacturers, but the inhabitants of the Plain of Lombardy excel in the production of raw material. Recently there has been a great industrial development in northern Italy, and silk factories are now in operation at Milan, Turin, Como, Genoa, Florence, Venice, Bologna, and

other towns, many being worked by hydro-electric power. Murcia and Valencia in Spain, Palermo in Sicily, Salonica in Greece, and Sofia and Philipopolis in Bulgaria are other centres of the industry.



The industrial centres and chief railways of the Ruhr coalfield and the Maas valley coalfield. The Ruhr coalfield lies between the Lippe and the Ruhr.

The manufacture of silk is also carried on in several German towns near the Rhine, the chief centre being Krefeld, and also in Switzerland at Bâle, Zurich, and Lucerne.

(ii) COTTON, WOOLLEN, AND LINEN GOODS. Silk is the most important textile industry of the Mediterranean region, but one feature of the industrial development in Italy mentioned above, was the establishment of a number of cotton factories in the basin of the Po, and also at Genoa, due in the first place to the action of Swiss manufacturers, who set up mills in Italy to avoid heavy import duties on their goods. Woollen goods also are manufactured in northern Italy, especially at Biella, Turin, Brescia, and Genoa, and in the south there is a new textile centre at Naples.

The chief textile centre in Spain is Barcelona, where there are large factories for the manufacture of cotton, wool, linen, and jute, many of them equipped with British machinery, and worked with British coal.

It is, however, in the coal-producing areas of the northern plain, and especially in north-east France, Belgium, and Germany, that the manufacture of cotton, wool, and linen has been most highly developed. Even in the eleventh century Flemish workers in wool and linen had made a great reputation; Ghent, Tournai, Ypres, Bruges, and the French towns Arras, Valenciennes, and Lille were flourishing industrial cities. During the Middle Ages this region was the wealthiest part of Europe, largely through the trade in cloth. At some time during the period the manufacture of cotton was introduced into Europe from the East, first into Mediterranean countries, whence it soon spread into the textile areas of Flanders and Germany.

The western end of the European plain remains at the present day the most important textile area on the Continent, but there are flourishing centres elsewhere—on the coalfields of Poland, Czecho-Slovakia

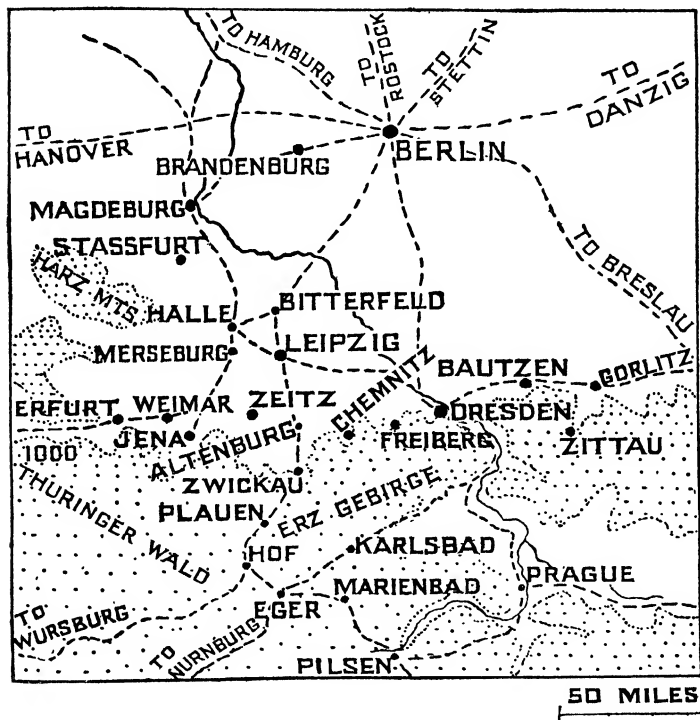
and Russia, and in the water-power areas of Sweden, Switzerland, and the Vosges region.

In France there are three important textile areas. The first is a region near the Belgian border that suffered severely during the European War, and in which Amiens and Lille are cotton centres, Cambrai a linen centre, and Tourcoing, Roubaix, Sedan, and Rheims woollen centres; the second is in the lower part of the Seine valley, where Rouen and Elbeuf are the chief centres for cotton and woollen goods respectively; the third is in the valleys of the Vosges mountains, an important cotton-manufacturing area, with Mulhouse and Colmar in Alsace, and Epinal, St. Die, and Belfort on the western side of the mountains as the chief centres.

The Belgian towns are Ghent, with factories for both cotton and linen, Courtrai, Tournai, Brussels, and Bruges producing linen and lace. These towns are near to important flax-growing areas, but the raw material used in the factories comes mainly from Russia and Lithuania.

In Germany there are large numbers of workers in cotton and wool in the towns of the Ruhr coalfield, chief of which are Elberfeld and Barmen. Farther east Chemnitz and Zwickau are well known as the cotton centres of Saxony; but the woollen industry is carried on both in these towns and in many smaller ones in the same province. Another cotton-manufacturing area is in the highlands of the south, some distance from coalfields, but with ample supplies of water-power. Amongst the towns engaged in the work are Stuttgart and Cannstatt in Wurtemberg, Ulm and Augsburg in Bavaria.

In Czecho-Slovakia woollen goods are made at Prague and Brünn, and there are many cotton and



The Saxony industrial region (with parts of Czecho-Slovakia) showing chief railways and towns.

linen mills in small valley-towns in the Riesen Gebirge and Sudetic Mountains on both the Bohemian and German sides.

Farther east still are the Polish towns of Lodz,

Bielitz, and Warsaw, turning out cotton, woollen, and linen goods, whilst Moscow is the chief centre in Russia for woollens and linen.

The cotton and woollen factories of Norrköping in Sweden, and the cotton factories of Zurich, St. Gall, and Glarus in Switzerland, are worked either by water power direct, or by hydro-electric power.

Engineering and Metal Work. Industries of this type require fuel, ores, and power, and the ideal location is therefore an area that yields both coal and iron, and that possesses also facilities for transport. Hence, amongst the large number of engineering areas in Europe the most highly developed are the Franco-Belgian coalfield, the Ruhr district, Saxony, and Silesia. Moreover, industries are interdependent, so that they appear to have the power to attract each other, and the establishment of one leads to the development of associated industries in the same district. This attractive power is most strongly manifested by the textile industries, and it explains the existence of machine-making trades in cloth manufacturing areas.

The belt of land some 200 miles in length, which includes the Franco-Belgian and Ruhr coalfields, is crowded with towns that contain a large proportion of workers in iron and steel, or in some branch of engineering. Lille and Valenciennes produce machinery for the French textile industries; Mons, Charleroi, Namur, Liège are Belgian towns where there are blast furnaces, steel works, and factories for the building of locomotives and machinery.

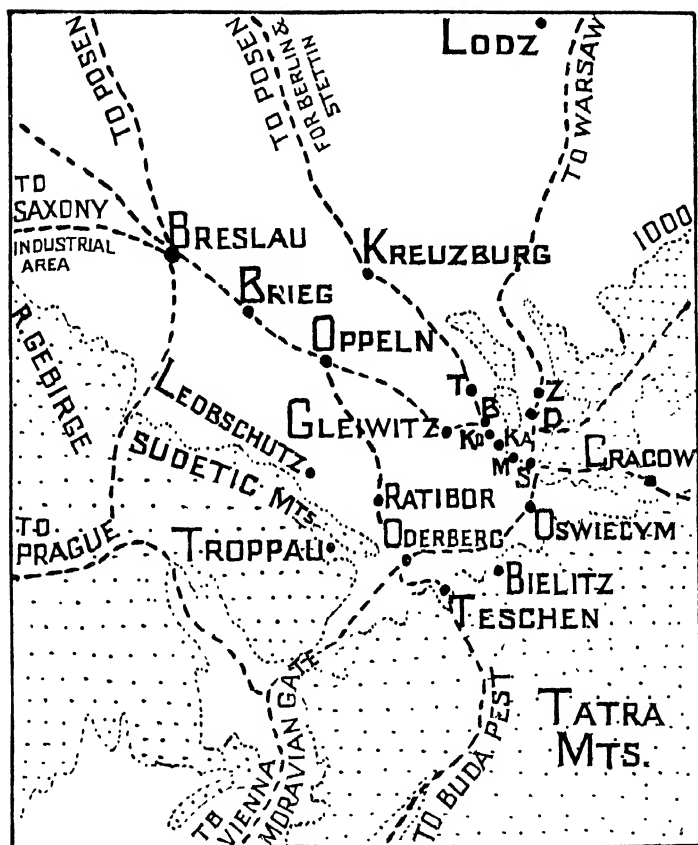
Before proceeding farther eastward, we may note that there is in the east of France another group of

towns, the industries of which are dependent upon the Saar coalfield and the iron-fields of the Moselle valley and Lorraine. Nancy and Port-à-Mousson are iron-working centres, and Longwy has important steel works. Two more centres situated on small coalfields in the Loire basin are Le Creuzot, with works for railway plant and ordnance, and St. Etienne, with iron and steel works; at Lyons there are factories for the building of motor-cars, and machinery for the silk industry.

Returning to the northern plain, we find in the Ruhr region Essen, Mülheim, Dusseldorf, Duisberg, Dortmund, and Gelsenkirchen producing pig-iron and steel, and each has some special branch of engineering; Essen and Dusseldorf are the best known heavy engineering centres. Solingen, in the same region, is the "Sheffield" of Germany, producing large quantities of cutlery, razors, and tools.

But one Sheffield trade, the plate industry, is located in Saxony, where also there are iron foundries and steel works at Zwickau, and workshops for textile machinery in both Zwickau and Chemnitz. This engineering region extends down the Elbe valley through a number of small towns as far as Bitterfeld and Magdeburg, near the former of which are some of the largest electrical works in Europe, and it may be regarded as including Berlin, where there are many people engaged in making textile and electrical machinery.

Connected with this area by a railway through the Elbe gap in the Erz Gebirge are the engineering centres of Czecho-Slovakia. These include Kladno with its iron foundries, Prague, Pilsen, and Brunn with machine shops. Before the separation of Czecho-



50 MILES

The Silesian industrial region, showing chief railways and industrial centres. The railway from Oderberg through Oppeln and Breslau is laid in the valley of the Oder. (T = Tarnowitz, Ko = Königshutte, Ka = Kattowitz, M = Myslowitz, S = Szczakowa, D = Dömbrowo, Z = Zomokowitz.)

Slovakia from Austria, fuel from the coalfields of Brünn and Silesia was used for the support of the industries of Styria and Carinthia—iron-smelting and the manufacture of cutlery, tools, and machinery. After the separation supplies of coal to Austria were refused, and though there are good stores of iron at Eisenerz and other places, the outlook for the Austrian iron industry is anything but promising. It is estimated that about 2,000,000 horse-power is available in mountain streams, the development of which might restore Austrian industries.

Silesia—including parts of Germany, Poland, and Czecho-Slovakia—is a most important engineering region, and it is particularly famous for its spelter or zinc industry, carried on in German territory and, until 1914, fed largely with Australian ore. A large number of towns, Tarnowitz, Beuthen, Königshütte, Gleiwitz, Kattowitz, Dombrowo, and others, clustered about the network of railways formed by the lines from Breslau, Warsaw, Cracow, and Vienna, have grown in connexion with works established for the rolling of spelter sheets and plates, the manufacture of steel, and the building of machinery used in the adjoining textile areas.

Engineering regions of somewhat less importance than those mentioned above are found in Russia, Italy, and Switzerland. Moscow is the chief engineering centre in Russia, producing machinery for the textile industries of the city and the surrounding area, and supplied with material partly from the Donetz iron-working region in the south. Milan and Turin in Italy, and Berne and Geneva in Switzerland are all engaged in the construction of electrical

machinery. In the two Italian towns there has been an enormous development of engineering activity in recent years. There are workshops for the building of locomotives and railway wagons, and in each town there are some very important motor-car works, giving employment to many thousands of people.

Sweden, possessed of large deposits of excellent ore, has long been famous for the manufacture of steel. But the industry declined after the introduction of coal for smelting purposes, and the ore has since been worked largely for export to Germany and Britain. A revival has taken place during quite recent years, and there are now nearly 100,000 people engaged in the manufacture of steel and of agricultural machinery.

Shipbuilding, a specialized form of engineering, is a most important industry in all the countries of North-west Europe, and in Spain and Italy. In 1920 the leading countries, judged by tonnage launched, were, in order, Holland, Germany, France, Italy, Denmark, Spain, Norway and Sweden. A complete list of towns in which shipbuilding and the associated industries—the making of boilers, marine engines, pumps, steering-gear, &c.—are carried on would occupy many pages; but in view of the special interest of British people in this group of industries, it will be useful to have a short list of the more important centres. These are arranged below, under the names of the respective countries:

Holland. Schiedam, Rotterdam and Dordrecht on the Maas, and Amsterdam.

Germany. Vegesack, Bremen, and Bremerhaven on the Weser, Hamburg (Elbe), Rostock, Stettin, Kiel, and Lubeck on the Baltic.

France. Nantes and St. Nazaire on the Loire, Marseilles on the Mediterranean coast, Bordeaux, Dunkirk, Havre, and the naval ports Lorient, Cherbourg, Brest, Rochefort, which were turning out cargo vessels in 1920.

Italy. Spezia and Piombino on the north-west coast, Castellamare on the Bay of Naples, Leghorn, Taranto, and Trieste.

Denmark. Copenhagen (Zealand), Aalborg and Aarhus (Jutland), Svenborg (Funen).

Spain. Bilbao and Ferrol in the north, Cadiz and Cartagena in the south, and Barcelona.

Norway. Oslo and Larvik on Oslo Fjord, Stavanger, Bergen, and Drontheim on the west.

Sweden. Gothenburg, Malmo, and Landskrona on the south-west coast, and Stockholm.

Belgium. Antwerp.

19. EUROPEAN INDUSTRIES. PART II

Chemical Industries. Manufacturing processes, as carried on at the present day, depend directly or indirectly upon the chemical industries, and especially upon the manufacture of "heavy chemicals". Chief amongst these is sulphuric acid (oil of vitriol), one of the sources of sulphur for the manufacture of which is iron pyrites, a yellow ore that may frequently be seen in coal.

So important is sulphuric acid that it has been said that the prosperity of a country might be gauged by its output of this particular commodity; Britain, America, and Germany are the chief producing countries. Sulphuric acid is used in metal-working,

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in the manufacture of soap, glass, glue, bleaching-powder, and dye-stuffs, in the refining of oils and fats, in the manufacture of superphosphates and other fertilizers, and for many other purposes.

Hence, as one would expect, the manufacture of chemicals is carried on in each of the industrial areas mentioned above, and we need merely note that the districts of Liège, Elberfeld, and Silesia have a particularly large output.

A second branch of the chemical trade, which originated in a discovery by an English chemist, is the manufacture of dye-stuffs, drugs, benzol, and photographic chemicals from coal-tar products. This industry has been developed most successfully in Germany; especially by the Baden Aniline and Soda Works, a firm which, owning large factories at Oppau, Ludwigshafen and Merseburg, almost controlled the world's dye-stuffs market before 1914. In Silesia there is the Oberschlesien Chemical Works, which represents a combine of interests in coal-mines, iron, and chemical works formed in 1920 for the manufacture of tar, benzol and ammonia; the centres are Gleiwitz, Kattowitz and Gottesburg.

A third branch is the electro-chemical industry, in which artificial manures are made by "fixing" atmospheric nitrogen; that is, causing it to combine with lime, soda, potash, or ammonia. The industry received a stimulus some years ago by the announcement that the sodium nitrate beds of South America, which have long supplied Europe with fertilizers, would be exhausted by 1923; it has since been proved that the estimate was incorrect.

The electro-chemical industry is carried on in places

that are well supplied with water-power. No European country is better off in this respect than Scandinavia, and at Notodden, Rjukanfoss, Odde, and other towns in Norway the industry is highly developed. The work is also carried on in Switzerland, and in the Alpine valleys of northern Italy. In 1918 both Norway and Italy exported over a million pounds' worth of chemicals to Britain.

The chief electro-chemical centres in Germany are Merseberg on the Saale, a tributary of the Elbe, Hindenburg in Silesia, Munich and Burghausen in Bavaria. For the last of these a big water-power station is being constructed on the Alz. Germany has, it should be noted, valuable beds of potash salts at Stassfurt, which have greatly helped the development of agriculture in the country.

Glass-making, now an important chemical industry, was introduced from Egypt to Rome and other Mediterranean cities in the first century, and Venice eventually became the most famous centre of the industry. Though they still have a great reputation, the Venetians have in modern times been overshadowed in the commercial world by the Germans, Belgians, and Czechs, who have access to large supplies of pure quartz. Bavaria, Czecho-Slovakia, and Silesia are now the chief glass-producing areas in Europe.

Timber Industries. In spite of the fact that the great population of Europe makes it necessary to devote all available land to food production, there are extensive tracts of forested land within the continent. Forestry does, in fact, receive considerable attention in almost every European country, and in some cases—Germany in particular—the cutting of

timber and the planting of trees are carried out in a very systematic fashion.

In central and southern Europe, where the population is very dense, forest is almost entirely restricted to highland areas—to the Cantabrians, Pyrenees, Alps, Carpathians, and other mountain systems. But timber industries have not been greatly developed in these regions, and such countries as Bulgaria, Rumania, Yugo-Slavia, Czecho-Slovakia, and Austria have forest reserves that await exploitation; the trees are mainly oak and beech, but conifers are characteristic of the higher land in the Alpine region.

At present the most important timber-producing lands are those which lie around the Baltic Sea. Norway has 25 per cent. of its surface covered with coniferous forest, Sweden 54 per cent., and Finland 60 per cent., whilst large forests of the same kind exist in northern Russia and in Esthonia, Latvia, and Lithuania; in 1920 timber took first place in the list of exports of Esthonia and Finland, and it came second to flax in the export trade of Lithuania.

In all these northern lands a large number of people are engaged in timber industries, some in lumbering and preparing logs for export, others in saw-mills, planing-mills, and pulping-mills, or in factories for the manufacture of furniture, joinery (window-frames, doors, &c.), paper, and matches.

The British, whose home supplies of timber are rather limited, receive a considerable proportion of the output of the timber industries of northern Europe. Thus in 1920 the Norwegians exported through Oslo and Drammen large quantities of planed goods, box boards, sawn timber, wood pulp, cellu-

lose, printing paper, and packing paper. Similar goods were sent from Gothenburg in Sweden, and from Helsingfors and Abo in Finland.

The immense water-power resources of Sweden have greatly helped the development of the timber industries, and incidentally played an important part in the industrialization of the nation. During the last fifty years the proportion of industrial workers has more than doubled, whilst the percentage of agricultural workers has fallen from 72 to 48. Along the Baltic shores there are 1,400 saw-mills, providing work for 44,000 people; nearly 30,000 are employed in pulping-mills and paper-mills, and 12,000 more are employed in joinery factories. In addition there are large match factories at Jönköping, and some great shipbuilding yards.

Another region where timber industries of commercial importance are carried on is Bavaria, where Nuremburg has long been famous for the manufacture of toys, which are not now, however, made exclusively of wood. At Würzburg and Munich there are important furniture factories, whilst clocks, musical instruments, and other articles are made in the Nuremburg district. Pianos, a well-known German specialty, are made at Berlin, Stuttgart, Dresden, and Coblenz.

Foods and Wine. **BEET SUGAR.** The discovery that the juice of the beet contained sugar was made by a German chemist in 1747, and before the end of the eighteenth century factories for the manufacture of beet sugar were erected in Silesia and Bohemia. Early in the nineteenth century the industry was started in France, with the strong

support of Napoleon, and by degrees it spread into nearly every European country—Scandinavia and Turkey being exceptions.

During the latter half of the nineteenth century the beet-sugar industry was supported by “bounties”, that is, sums of money paid to manufacturers to enable them to sell their goods cheaply in foreign countries. In little over twenty years the output of European factories increased from 200,000 tons to 2,000,000 tons. At the beginning of the present century Germany alone was producing 2,000,000 tons, and the British people, the greatest sugar-consumers in the world, were importing three times as much beet- as cane-sugar.

At the present day the chief sugar-producing areas in Europe are Germany, northern France, Ukraine, Czecho-Slovakia, Poland, and Belgium. The output has in some cases been temporarily reduced by the destruction of factories during the European War. Poland, for example, had 102 sugar factories in 1913, but only 35 in full working condition in 1920. Next in order of output come Holland, Italy, Switzerland, and Spain; in the remaining countries the industry is comparatively insignificant.

DAIRY PRODUCE. Dairy farming, and the manufacture of butter, cheese, and condensed milk, provide occupation for a large number of European workers, but these branches of industry are of special commercial importance in Norway, Sweden, the Netherlands, Denmark, Switzerland, and northern Italy. Large quantities of butter are exported from the first four of these countries, condensed milk especially from Norway, Denmark, the Netherlands, and Switzerland,

and cheese from the Netherlands, Switzerland, and Italy.

The industry has been most highly developed in Denmark. Danish farmers organized their work on the co-operative system in 1880, and within twenty years Denmark had become the chief butter-exporting country in the world. Over 80 per cent. of the butter produced is made in co-operative dairies, of which there are 1,200 in the country. The skimmed milk is returned to the farmers and used for feeding animals, especially pigs. Pig-rearing and bacon-curing may be described as the companion industries of dairy-farming, and in Denmark, at any rate, poultry-rearing is also a companion industry. Eggs and bacon have an important place in the export trade of Denmark; in 1918 Britain alone received $2\frac{1}{2}$ million pounds' worth of eggs from Denmark. Most other dairy-farming peoples have copied the example set by the Danes.

The manufacture of margarine, really a chemical industry, is carried on extensively in Holland and Denmark. The whole of the Danish output is consumed at home generally, but in the export returns of Holland, margarine completely overshadows butter.

WINE. Wine-making is an important industry in all Mediterranean lands, and also in those parts of Germany and Hungary that lie south of the "vinc-limit". Wines are commonly named either after the region in which they are manufactured, or after the town of export. Thus port wine is named after Oporto in Portugal, and sherry after Jerez near Cadiz; Champagne and Burgundy are named after the French provinces which produce them. Clarets

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are manufactured in the Garonne district of southern France. Chianti is a famous Italian wine, and Marsala is produced in Sicily. Hock and Moselle are made in Germany, and Tokay wines in Hungary.

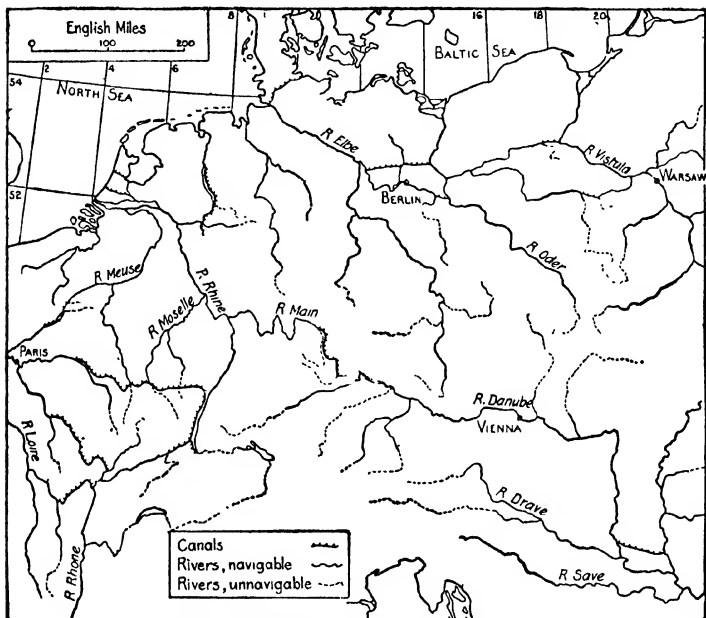
EXERCISES

1. Read *The History of Commerce in Europe*.
2. Write out a list of the chief industrial countries in Europe, and state the advantages each country possesses.
3. Make out a list of the textile manufacturing areas of Europe, stating the kind of goods produced in each case.
4. Enumerate the branches of the chemical industry, and say in which European countries each branch is important.
5. What are the chief products of the timber industries, and where are the industries located in Europe?
6. What is meant by "bounties"? Give a short account of a European industry established with the aid of bounties, saying in which countries it is carried on.
7. Name European countries in which the preparation of foodstuffs for export is an important industry; name the particular commodity in each case.

20. EUROPEAN CANALS AND RAILWAYS

THE continent of Europe is richly provided with natural waterways, the commercial value of which, especially in the countries of the central plain, has been greatly increased by a system of canals. Thus the Loire is linked to the Rhone, the Rhone to the Seine and the Rhine, the Seine to the Scheldt and the Meuse, and the Rhine to the Danube. It would therefore be possible to go by water from Havre or Antwerp through the heart of the continent to the Black Sea.

There is at present no connecting link between the Danube and the Elbe, but the Czecho-Slovak Government, having access under the Peace Treaty to both of these rivers, propose to cut a canal and so form



The Navigable Waterways of Central Europe.

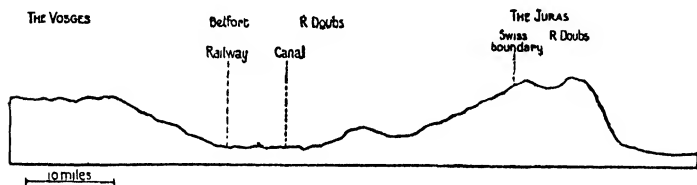
a waterway through their own country from Hamburg to the Black Sea.

Amongst other interesting schemes is the French proposal to improve the navigation of the Rhone by means of canals, so that (1) Switzerland may be reached by vessels of a thousand tons, and (2) coal

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from the Saar area and manufactured articles from Alsace may be carried by water to the Mediterranean.

Though an enormous amount of merchandise is carried on the inland waterways of Europe, the railway is, of course, the chief means of transport for both goods and passengers. Free communication throughout the Continent is interfered with to some extent, in that Russia and Spain have railways of broad gauge; in all the other countries railways are built to the standard gauge of 4 ft. 8½ in.



Diagrammatic section across the Gate of Burgundy.

With few exceptions, European countries have an elaborate system of railways; but a large number of lines, being of local importance only, will not be noticed here. The arterial railways, that is, the main lines of communication across the continent, should be studied on a physical map. The course of these lines through Central Europe is marked in the map on pages 216-17, where land masses over 1,500 ft. in altitude are drawn in rough outline for the purpose of showing the natural routes that lie between them.

Points that should be specially noticed are the importance of the Rhone valley for Mediterranean traffic, of the Burgundy Gate to communication between France, Germany, Switzerland, and Italy,

of the Austrian Gate and the valleys in the highlands south-east of Belgrade to the Orient Express route, and of the Elbe Gap and the Moravian Gate to communication between the plain and centre of Europe. The map also shows the great obstacle opposed to railway builders by the Alps, which have been pierced by tunnels, the St. Gothard, Simplon, Loetschberg, and Mont Cenis ; the shortest of these is 8 miles long.

London is connected to the European railway systems by a service of packet steamboats to such ports as Boulogne, Calais, Ostend, and the Hook of Holland ; thus there are alternative routes to Mediterranean cities. The following are routes of special importance :

1. The Orient Express.

From Paris to Constantinople, via Strassburg, Karlsruhe, Vienna, Belgrade, and the valleys of the Morava and Maritza. At Nish a branch is thrown off to Salonica.

2. The Simplon Orient Express, established in 1919.

From Paris, via Lausanne, the Simplon, Milan, Trieste to Belgrade ; thence to Constantinople.

3. The P. and O. Marseilles Express, for boats to Alexandria and Port Said.

From Paris to Marseilles via the Rhone Valley.

4. The Mont Cenis Express.

From Paris, via Mont Cenis tunnel and Turin to Brindisi, whence the Lloyd Triestino Company's boats sail to Alexandria. An alternative route is via the Simplon to Trieste, thence by boat to Alexandria.

5. The Sud Express.

From Paris to Madrid, via Orleans, Bordeaux, and Biarritz.

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6. The Mediterranean Express.
From Calais, via Paris, Dijon, and Rhone Valley to Cannes, Nice, Monte Carlo, Mentone, and San Remo.
7. The Engadine Express.
From Calais and Paris, via Bâle and Zurich to Davos, Coire, and St. Moritz.
8. The Brenner Express.
From Berlin, via Prague, Munich, Brenner Pass, and Verona to the Riviera, Naples, and Brindisi.
9. The Siberian Express.
From Petrograd and Moscow to Vladivostok. This route is reached from North Sea ports via Brussels, Cologne, Berlin, and Warsaw.

EXERCISES

(Continental Railway Guide required)

1. Name two routes by which one might travel from London to each of the following places, mentioning the chief towns passed through on the way : Berlin, Belgrade, Port Said.
2. Make out a time-table for the journey by the shortest route to each of the following places, giving hour and day of starting and arrival in each case : Constantinople, Port Said, Algiers, Moscow, Vladivostok.

21. BRITAIN

FROM PRIMARY PRODUCTION TO INDUSTRIALISM

ONE fact revealed in a survey of the activities of the world's workers is the gradual increase in the number of industrial workers at the expense of the primary producers' group. This tendency towards

industrialism is most noticeable in the British Empire, Europe, and the Far East, and it is probably more strongly manifested in Britain than in any other country in the world. As the "change over" started in this country some centuries ago, sufficient time has elapsed for an appreciable effect to be produced in the life of the nation, and in making a survey of the activities of the British people, that effect should be duly noted.

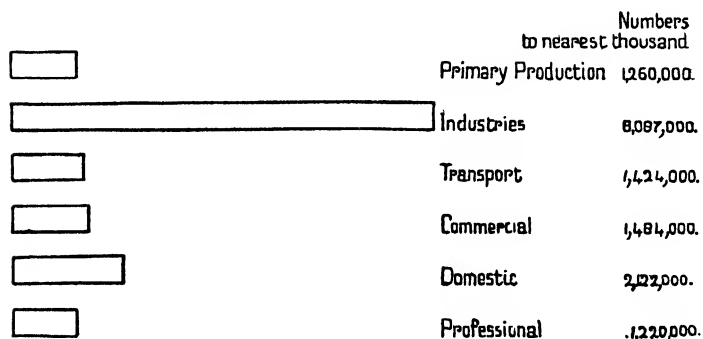


Diagram showing proportion of the working population of England and Wales engaged in the six groups of occupations, according to the census returns of 1911.

The records of old historians show that the export trade of Britain once consisted almost entirely of agricultural produce and minerals. In the year 359 the Roman emperor sent a fleet of vessels to England for corn—to be sent to the colonies on the Rhine; for over 200 years Venetian galleys called annually at Southampton for cargoes of raw wool; in the twelfth century English exports to the Continent included corn, cattle, meat, wool, lead, tin, and jet.

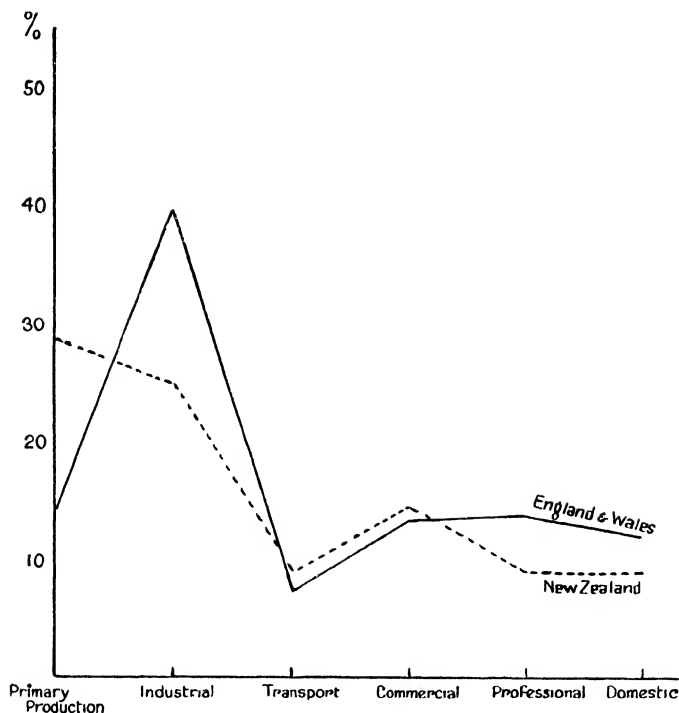
Whatever industries existed before the end of the twelfth century must simply have provided for home markets ; to the outer world England was a country of primary producers.

From the eleventh century onward, however, the foundations of British textile industries were being laid, largely by Flemish weavers, the first of whom came shortly after the Norman Conquest. Immigrations of foreign workers occurred at frequent intervals to the end of the sixteenth century.

Among the places where the woollen industry was established at an early date were Cumberland, Pembroke, and Norfolk, Bristol, Winchester, Lincoln, Hull, Beverley, York, and Berwick ; before the end of the sixteenth century the industry had also been established in the west of England, the West Riding of Yorkshire, Lancashire, and Scotland. Places in the latter group were particularly suitable, for mountain streams provided power to drive machines, and water for washing and fulling purposes.

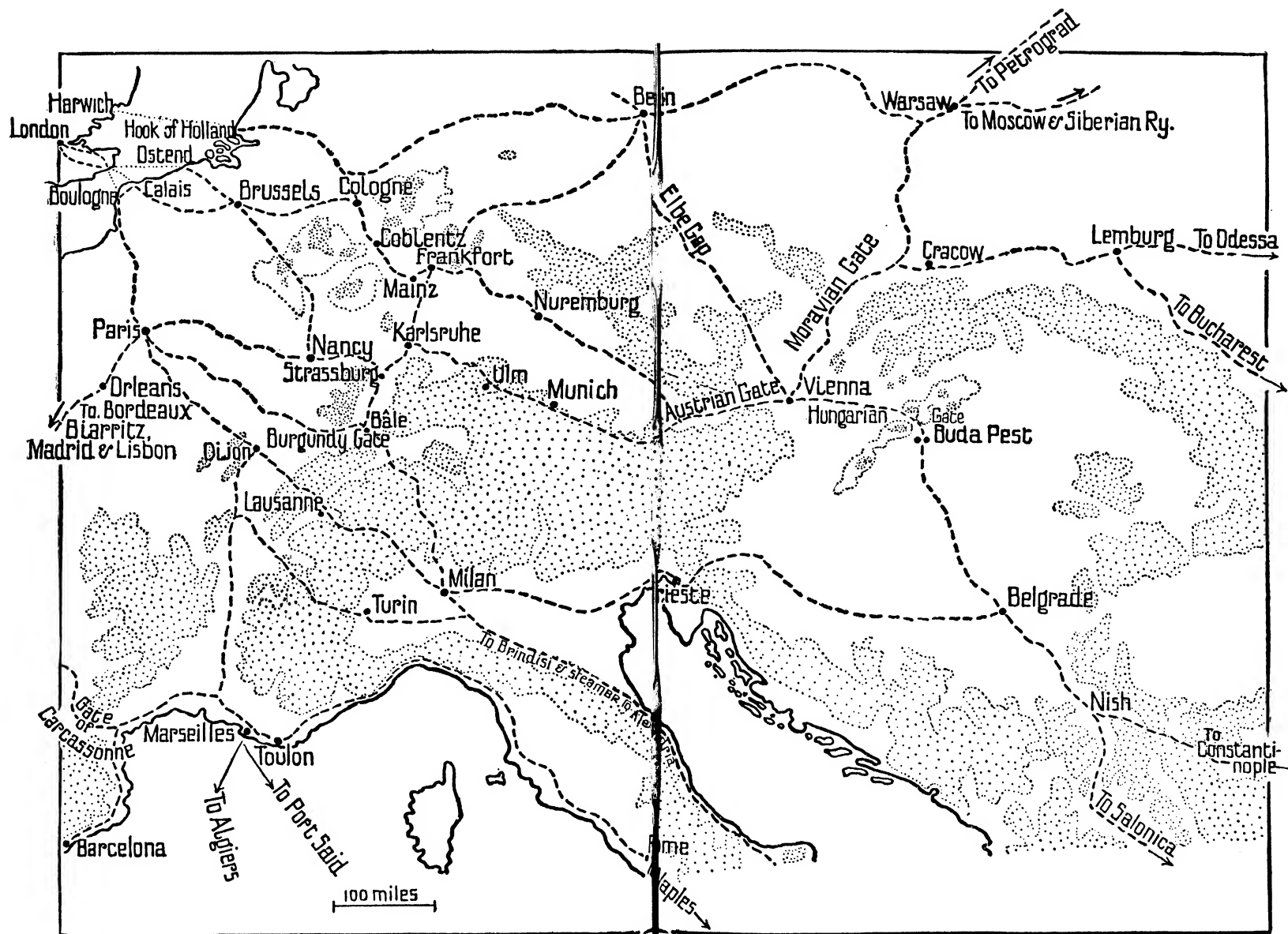
Workers settled in Maidstone and introduced the making of thread ; some engaged in the linen manufacture at Norwich, and others began the making of needles at Colchester. A large number of Huguenots, driven from France by religious persecutions, took refuge in the British Isles ; some settled in London, Canterbury, and Coventry, and greatly improved the manufacture of silk ; others found a home in the north of Ireland and started the silk industry there.

The cotton industry, the future national importance of which none could foresee, had a bitter struggle for existence in the early part of the eighteenth century, for other textile workers, fearing their own trade



Comparison of the occupation groups of England and Wales with those of New Zealand. The diagram was made by plotting the percentage that each group forms of the total number of workers, for each country.

would be damaged, tried to strangle it. Foreign cotton-weavers started work in several places in south-eastern England, to be driven away by riots, until finally they found comparative peace in Lancashire, a county which, having good supplies of water-



The Railways of Central Europe. Dotted

portion represents land over 1,500 ft. in altitude.

power in its Pennine valleys, a population skilled in textile work, and a humid climate, was the best place in England for this particular industry.

The immediate effect of the industrial developments described above was a change in the character of British trade. They led also to the adoption of those various devices for the encouragement of home industries and the development of foreign markets known as "protection", "reciprocity", "retaliation", "preference", "free trade"—but the facts in the next paragraph speak for themselves.

In 1454 the importation of silk goods was prohibited; in 1463 regulations were made to keep plenty of wool within the country; a statute of 1483 prohibited the importation of over sixty manufactured articles—textiles, metal goods, and others. In the reign of Elizabeth the English exports included cloth, lead, tin, hats, stockings, and silks. Under an act passed in 1571 every person over the age of six was required to wear on Sundays and holy days "a cap of wool fully wrought in England". James I prohibited the sending of British cloths to be dyed in Holland, and granted an Englishman—Alderman Cockayne—a monopoly in the dyeing and dressing of woollen cloths. Holland and Germany retaliated by refusing to allow English cloths to enter their ports; Cockayne's monopoly was withdrawn in 1615. In 1703 a commercial treaty between England and Portugal provided that English woollen goods should be admitted to Portugal, on condition that Portuguese wines were admitted into England on payment of duty two-thirds that levied on French wines. A few years later commercial treaties were concluded with

France and Spain ; whilst in 1721, with a view to encouraging industries, Walpole removed export duties from 106 articles of British manufacture, and import duties from 38 raw products.

Such events mark stages in the development of British industries, and of foreign markets for the industrial products. But the most remarkable development began near the end of the eighteenth century, being marked by the application of the steam-engine to manufactures, the discovery of new methods of smelting iron, the invention of machines which greatly increased the rate of production, and the transfer of textile industries from homes to factories—a series of changes usually described as the Industrial Revolution.

Up to the eighteenth century textile industries were carried on in almost all parts of the country, as is shown by the list of places given above ; there were, in fact, hand-loom weavers in almost every town and village. Smelting furnaces were erected in such districts as possessed a good supply of timber for the making of charcoal ; at the beginning of the seventeenth century Sussex provided half of the pig-iron used in England.

With the beginning of the Industrial Revolution, a good supply of coal became the chief consideration in both textile and iron industries. Geographical factors therefore had full play in determining the distribution of manufacturing centres—and consequently of population. As we noted in Chapter III, the coal measures are at or near the surface in South Wales and the Midlands, in four areas in the north of England, and in the Scottish Lowlands. These

thus became the main industrial regions of the country. Elsewhere manufactures either declined or were abandoned altogether, but there is a notable exception in the north of Ireland, the coal for which comes over the sea from Ayrshire.

During the nineteenth century the leading British industries became localized as follows :

Scottish Lowlands. Shipbuilding, engineering, chemicals, and cotton in the west ; textiles (chiefly linen and jute) in the east.

Tweed valley. Woollen industry.

Cumberland. Iron working.

North-east England. Shipbuilding, iron working, and chemicals.

Lancashire. Cotton, woollen, machinery, glass, chemicals.

Yorkshire. Woollen, worsted, steel, leather, chemicals, engineering.

Midlands (north). Pottery, leather, hosiery, silk.

„ (south). Iron working.

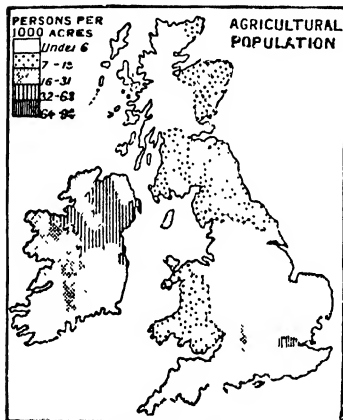
South Wales. Iron working.

West of England. Woollen industry.

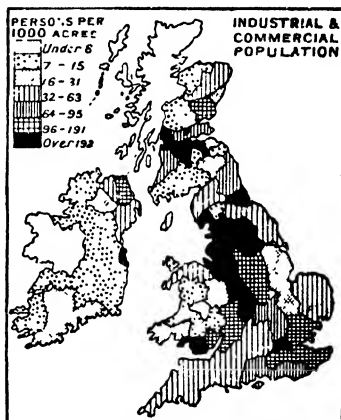
But the first half of the nineteenth century was a dark period for British industries. Commerce was restricted by protective duties, and a tax on imported corn for the benefit of British farming kept prices at a high level. Moreover, the change from manual to machine work in the textile trades had been made very quickly, and for a time many people were out of work. Bands of Luddites destroyed much machinery, only to find that conditions were not thereby improved. Eventually the adoption of a Free-Trade

policy and the abolition of the Corn Laws by Sir Robert Peel prepared the way for the development of British industries.

During the second half of the century commercial and industrial development proceeded at a wonderful rate, being greatly aided by the introduction of rail-



Distribution of agricultural, pastoral, and fishing population in the British Isles.



Distribution of industrial and commercial population in the British Isles.

way transport and by the repeal of the Navigation Acts. Further inventions quickened the process of manufacture, reduced the price of the finished article, and led to a demand for factory-made goods throughout the world. Britain, first in the field, and with excellent coalfields, was without a competitor for many years.

Raw cotton Britain never has produced, and the demand for other raw materials speedily outgrew

the home supplies. The call upon primary producers in other lands led to a further extension of over-seas markets, and this in turn to efforts after increased production in the factories. Thus there were continual calls for labour upon rural Britain. The calls were responded to readily enough; industrial towns increased in size and in number, whilst agricultural areas declined in population.

According to the Census returns of 1921 there are one hundred and one great towns (i. e. with population over 50,000) in England and Wales. Sixty of these, in addition to many other towns of over 20,000 people, are in the industrial areas, ten are seaside places, and eighteen are in the London district. Thus there are barely a dozen towns of over 50,000 people distributed over the wide agricultural lands, and most of them are towns with special industries such as the manufacture of farm machinery.

Ireland is still mainly a country of primary producers, having only five towns with a population of over 30,000, and they contain less than one-fifth of the total population. In Scotland the conditions are very different, nearly half of the population being concentrated in twenty industrial towns in the Lowlands.

It thus appears that the change from primary production to industrialism has been in progress in Britain during the last four or five centuries, and that it has proceeded at the greatest rate during the last sixty years.

The remarkable development in recent times is largely due to the influx into industries of professional workers—chemists, metallurgists, electricians,

designers, and others—whose labours and researches have had so powerful an influence upon industrial progress that we must briefly notice some of their achievements.

The most far-reaching discoveries and inventions of the period belong to the domain of steel and chemical industries ; but they have affected all other manufacturing processes, and even primary occupations, in a greater or less degree. The beginning of the period was marked by the introduction of Sir Henry Bessemer's process for quickly converting pig-iron into steel. The process consists in burning the carbon and silicon out of the molten iron by means of a blast of air, and then adding cast iron containing sufficient carbon to convert the whole mass into steel.

It was found, however, that the Bessemer process did not remove phosphorus, an element which is present in many large deposits of iron ore, including those of the Jurassic rocks ; for this reason Bessemer used Swedish iron. But in 1878 two English metallurgists found that phosphorus could be extracted in a very simple fashion ; using a converter lined with dolomite, they obtained the phosphorus, combined with part of the lining, as "basic slag". This discovery made it possible to use the Cleveland ore, with the result that Middlesbrough became one of the chief iron-producing towns. The basic slag from the Bessemer furnaces is a useful fertilizer ; but much English steel is now made by the Siemens Open-hearth process. In 1921 it was announced that a French engineer had discovered a method of making steel direct from iron-ore, by injecting hot air and coal-dust into the furnace. If the method proves to

be successful on a large scale, the steel trade may undergo another revolution.

Further investigations in steel-making have led to manganese steel, a very durable variety used for railway "points", tram-crossings, and the building of ore-crushing machinery; to the use of nickel and chromium, and of molybdenum and vanadium in the making of armour plates, high-speed steels, and rustless steel.

An interesting development of the textile trade consists in giving a "finish" to cotton goods. The discovery was made by a man named John Mercer, that cotton soaked in caustic soda acquired a silky sheen on drying; thus began the process of "mercerizing" cotton cloth. Not less interesting is the manufacture of "artificial silk" by converting wood-pulp or cotton waste into liquid by chemical processes, and forcing the liquid through tiny holes in a metal plate. The most recent development of this kind is the manufacture of "artificial wool" from wood-pulp.

More important than these, however, is the coal-tar colour industry, which originated in the discovery by the late Sir W. H. Perkin of a mauve colouring matter during an experiment with aniline—a coal-tar derivative.

Strange to say it was not the British but the Germans who took up the manufacture of dye-stuffs on a large scale, and before the European War the British textile industries were almost wholly dependent upon the German products. During the war the Germans used their dye-stuff factories for the manufacture of poison gas, which they introduced

into warfare. The British were therefore obliged to engage in chemical warfare, and it may be said that, indirectly, the European War stimulated the British dye-stuff industry.

The manufacture of dye-stuffs is described as a "key industry", being essential to the safety of the nation and to the prosperity of many other industries. The use of dyes is imperative for the success of the textile trades; choice colouring may mean the gain of a market. Besides this, the manufacture of dye-stuffs yields other substances from which are obtained antipyrin, phenazone, antifebrin, phenacetin, salicylic acid, aspirin, and other drugs, as well as saccharin, a number of photo-chemicals, and explosives. The chief British factories are at Manchester, Huddersfield, Ellesmere Port (Mersey), Silvertown (Essex), and Glasgow.

It was not until the end of the eighteenth century that anything was known about current electricity, and until the middle of the nineteenth, almost the only applications consisted of the electric telegraph and electro-plating. Greater progress was made after 1880, when the first serviceable dynamos were constructed, but the developments in connexion with electricity belong mainly to the present century. Attention was first paid to illumination. Arc lamps and carbon filament lamps were introduced, and then came a diligent search for improved filaments, leading to the use of tantalum, osmium, and tungsten.

The use of the electric furnace is modifying the Sheffield trades, and it made practicable the manufacture of calcium carbide, a source of acetylene and of special value for oxyacetylene welding in engineering

shops and shipyards; also carborundum, a silicide of carbon and most powerful abrasive; and artificial fertilizers, by the fixation of atmospheric nitrogen.

Electricity has been applied on a large scale to the driving of tram-cars, trains, and the machinery of factories and workshops. It is in this department that the great development of the future may be expected. River-power is utilized for industrial purposes on a large scale in many countries, particularly Canada, the United States, Switzerland, Norway, and Sweden. In Scotland there is a scheme of moderate dimensions at Kinlochleven.

In such schemes, water is either diverted just above a fall, or collected in a storage reservoir at a considerable altitude, and led through penstocks or pipes to a power-house situated at a lower level, where it operates turbines or water-wheels, which in turn operate dynamos. The electrical energy so generated is led away by cable to industrial centres.

English rivers are not in general very suitable for the purpose; but in 1920 a government department published details of what is commonly called the Severn Barrage Scheme. Connected with the barrage there would be a series of tide-driven turbines which would, it is said, yield 500,000 electrical horse-power at a cost of little more than a halfpenny per B. O. T. unit.

The harnessing of tidal energy, if carried out on an extensive scale, would probably result in a redistribution of industrial centres. A large portion of the raw material used in British factories is imported, and large quantities of the finished articles are sent abroad. The transfer of a factory to the seaside

would therefore mean a double saving of transport charges—of raw material *from* the port, and of finished article *to* the port—which would materially reduce the price of the article in a foreign market.

It is of interest to note that even without the advantage of tidal energy, a number of works, or portions of works, have been transferred from the Midlands to South Wales, and the shores of the Irish Sea.

Amongst the world's great water-power installations are the following :

<i>Scheme.</i>	<i>Horse-power.</i>
Proposed Severn Scheme	500,000
Amalgamated Niagara Falls Power Co.	385,500
Big Creek Development Pacific Light and Power Co.	350,000
Ontario Power Co.	200,000
Capdella River Flamisell, Spain	150,000
Keokuk Dam on the Mississippi	150,000
Toronto Power Co.	146,000
Kinlochleven (Scotland)	30,000

EXERCISES

1. Read *Outline of Industrial History*, chapters on "Textile Industries" and "Fuel".

2. Name the areas in which the leading British industries are now established, and areas which have declined in industrial importance.

3. What is meant by "home industries"? Mention some that exist in Britain at the present day, and say where they are located.

4. Explain the terms "protection", "free trade", "preference", and "retaliation".

5. What is meant by "key industries"? Give examples, and explain their importance.

6. Give a short account of the influence of professional workers on the development of industries.

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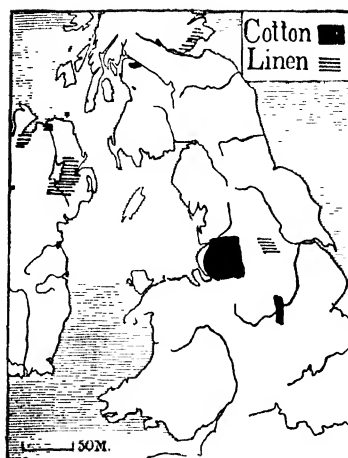
7. Write an essay on "Vegetable Fibres used in British Industries", mentioning the plants from which the fibres are obtained, the climatic conditions required for cultivation, the exporting countries, and the special use of each kind of fibre. (Refer to chaps. 7, 8, 10, 12, 15, 17.)

8. From the "Accounts relating to Trade and Navigation of the United Kingdom" write out a list of imported articles subject to Customs Duty at the present day.

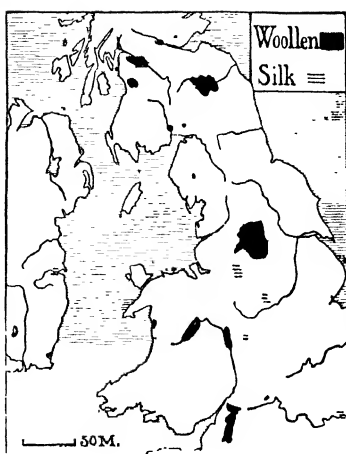
22. INDUSTRIAL CENTRES OF BRITAIN

THE distribution of industrial centres is best studied from a map, and this chapter therefore consists mainly of a series of sketch-maps of British industrial areas. The situation of the more important towns is shown, the "hundred and one great towns of England and Wales"—with the exception of some which are remote from industrial regions—being indicated by a square dot.

It will be observed that several factors, in addition to the presence of coal and metallic ores, have operated in determining the growth of towns, e. g. (1) Facilities for communication; towns are generally situated on low land—in valley or plain—and the largest towns are particularly well placed for the purpose of communicating with the rest and with London. (2) Supplies of water for industrial purposes, transport, &c.; nearly every town is close to a river. (3) Except in the case of the Midlands, there is an important group of seaports directly associated with each industrial area. The fortunes of the ports and of the industrial towns are very closely related. It should also be noted that the population of a



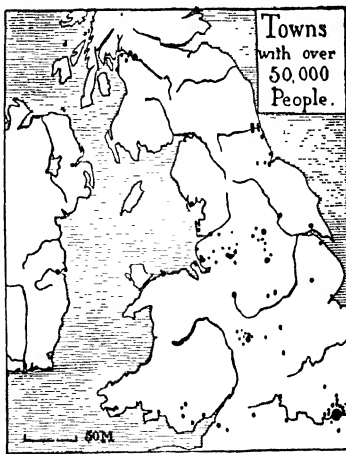
Distribution of cotton and linen manufactures.



Distribution of woollen and silk manufactures.



Distribution of iron-ore, ironworks, and shipbuilding.



Towns with over 50,000 inhabitants.

seaport contains a fair proportion of industrial workers, whose activities are connected with the raw materials in which the port specializes. Bristol (cocoa and tobacco) and Hull (vegetable oils) are good examples. (4) Each industrial area possesses a network of railways, and a main line connexion with London. Inspection of a railway guide will show that smaller towns are linked with great cities by a service of local trains, and that the chief trains on the main lines apparently run for the purpose of connecting these cities with the metropolis.

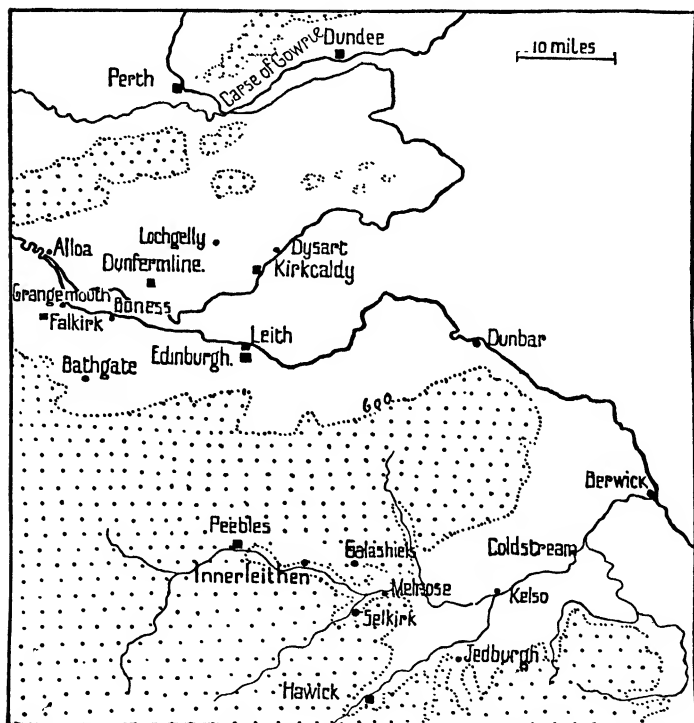
THE EAST OF SCOTLAND INDUSTRIAL REGION

Physical features divide the East of Scotland region into two areas (1) the basin of the Tweed, which is entirely without coal, (2) the Forth-Tay area, which includes the coalfields of Fife and Midlothian, and part of the Central coalfield.

The chief Scottish woollen manufacturing towns are situated in the Tweed basin, between the Lammermuir Hills on the north and the Cheviots on the south—hills which are the most important sheep-rearing areas in Britain. The cloth produced in this region has a very high reputation.

In the second area, coal is worked at Lochgelly and other places in Fife, and around the iron-working town of Falkirk on the south side of the Forth; much is exported through the ports on the upper part of the Forth estuary. Oil, extracted from shales worked to the south of Falkirk, is refined at Bathgate. But the most important industries are the manufacture of jute at Dundee, linen at Dunfermline and Dundee, oilcloth (from jute) and linoleum at Kirk-

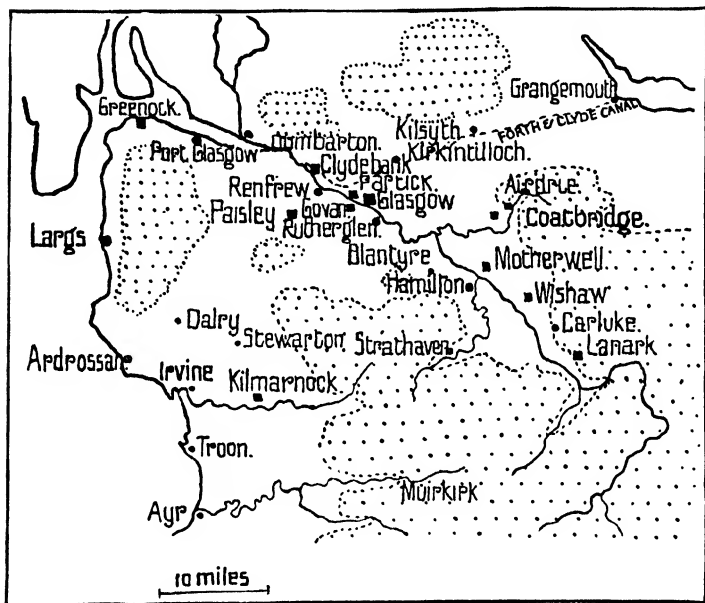
caldy. There are jute and linen factories at Perth, but this city is famous especially for its dye-works.



The East of Scotland industrial area. (Dotted portion shows land over 600 ft. in altitude.)

Leith, the chief port in the east of Scotland, has an extensive foreign and coastal trade, being in regular communication with the chief ports on both sides of the North Sea. The leading industrial establishments

—saw-mills, flour-mills, rope factories, and engineering works—are closely associated with the import trade and shipping.



The Clyde industrial area. (Dotted portion shows land over 600 ft. in altitude.)

THE WEST OF SCOTLAND INDUSTRIAL REGION

The Clyde basin is a shipbuilding and engineering area of a most important kind, with ample supplies of fuel in the coalfield through which the Clyde flows, and which stretches across the country to the Firth of Forth; and a great estuary that has been deepened

to meet the development in shipbuilding. Iron-ore was formerly obtained from the Lanark coalfield, but the numerous blast-furnaces are now dependent upon foreign supplies.

Naturally enough the shipbuilding towns, about twenty in number, are ranged along the banks of the estuary, whilst the iron-working centres, Coatbridge, Motherwell, Wishaw, &c., are somewhat farther up the river or in tributary valleys.

Other industries of importance are cotton (Glasgow and Paisley), sugar-refining (Greenock), chemicals (Glasgow).

Kilmarnock is another important engineering centre (locomotives), on the Ayrshire coalfield, from which coal is exported through Ayr, Troon, Ardrossan, and other ports.

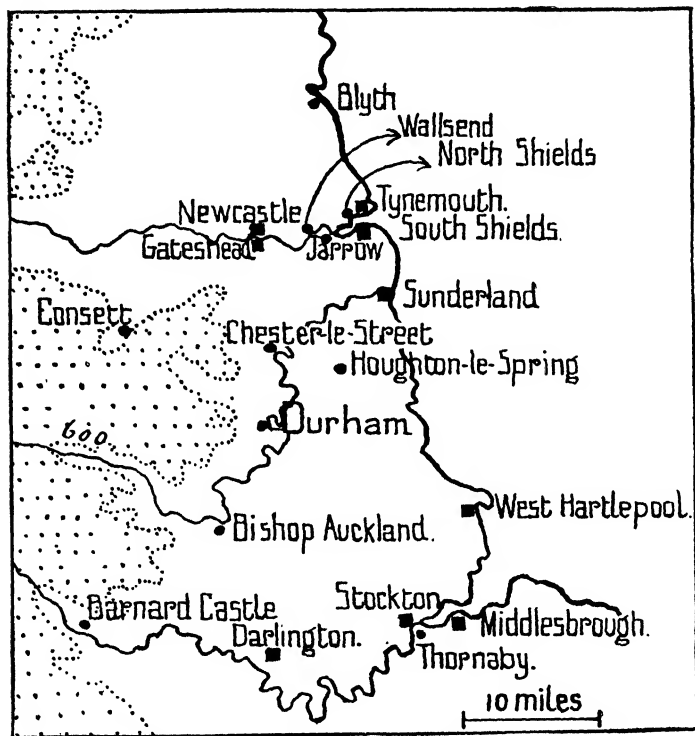
Glasgow and other ports on the Clyde carry on extensive trade with all parts of the world, and especially with India, U.S.A., Canada, and Latin America.

THE NORTH-EASTERN INDUSTRIAL REGION

The coalfield borders the coast from the river Coquet to the Tees, though overlain by Magnesian Limestone and New Red Sandstone in south-east Durham. Its western boundary is near the 600 contour line south of the Tyne, but the coal-yielding area narrows considerably north of that river. Consequently all the industrial towns and the numerous mining villages are situated on the coastal plain.

The export of coal from Blyth and the Tyne ports to places on the east coast of England is a very old trade ; but the valuable coking qualities of Durham

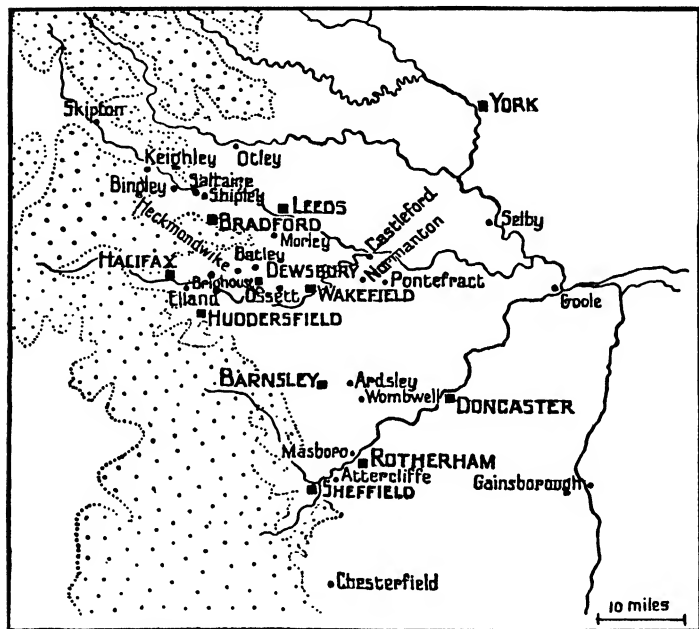
coal have found for it a market in various iron-smelting centres, including Barrow-in-Furness.



The North-eastern industrial region.

Shipbuilding and the associated industries are carried on in the towns on each of the three estuaries ; the Elswick works (Newcastle) are amongst the most important in the world. Hardly less important is the building of locomotives at Darlington and Newcastle,

work contributed to by the furnaces of Consett and Middlesbrough; the latter town came into existence after the discovery of the Cleveland ironfield.



The Yorkshire industrial area. (Dotted portion represents land over 600 ft. in altitude.)

THE YORKSHIRE INDUSTRIAL REGION

The York, Derby, and Nottingham coalfield lies on the eastern flank of the Pennines, extending southward from Leeds, which is situated on its northern border, to the cities of Derby and Nottingham. Its western edge lies near the 600 ft. contour line of the

Pennines, but it has a south-eastern extension of great magnitude under the New Red Sandstone and Jurassic rocks of Lincolnshire. The Yorkshire industries are therefore located in the undulating country that lies between the mountains and the Trent-Ouse plain.

The factors which determined the nature of the early industries have been mentioned in another chapter ; but it is not easy to account for the almost endless variety in industrial work of this region at the present day. As in other regions the main industries have "attracted" subsidiary ones, and individual human enterprise has been responsible for the founding of new trades ; noteworthy examples of the latter are Lister's velvet industry (Bradford) and Salt's alpaca manufacture (Saltaire and Bradford). The industries can, however, be arranged in six groups, viz. textiles, engineering and metal work, leather, chemicals, clothing, shipbuilding. The chief members of these groups are mentioned below under the names of the chief centres in each district.

Leeds. Woollens, engines, farm machinery, electrical machinery, earthenware, leather and boots, soap, clothing, chemicals.

Bradford. Worsteds, cotton, velvet, mohair, machinery.

Huddersfield. Worsteds, dye-stuffs.

Dewsbury and Batley. Heavy woollens (shoddy).

Halifax. Carpets, woollens, machinery, chemicals.

Barnsley. Linen, scientific glass.

Castleford. Glass and earthenware.

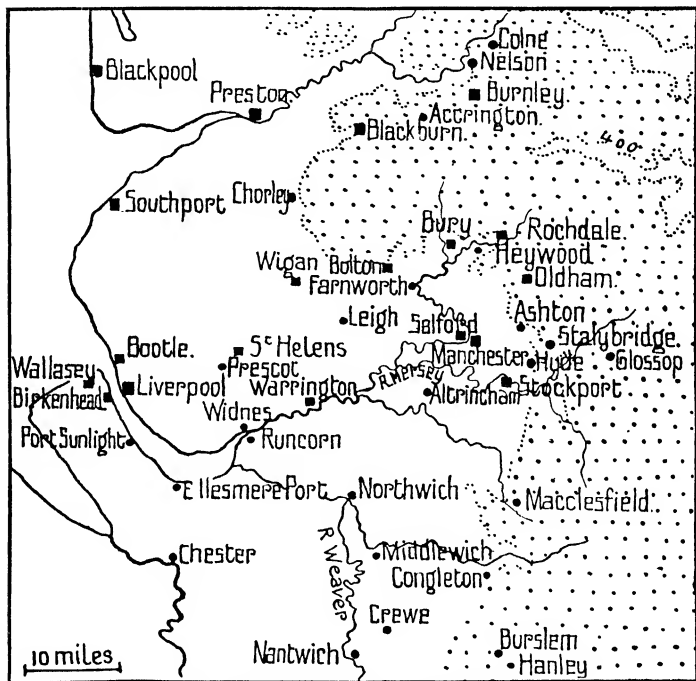
Sheffield. Metalwork of all kinds, especially steel, silver and electro-plate, and engineering.

Doncaster. Locomotives and railway carriages.

Selby and Goole. Shipbuilding.

THE LANCASHIRE-CHESHIRE INDUSTRIAL REGION

Towns engaged in branches of the cotton industry—spinning, weaving, bleaching, calico-printing—are situated in Pennine valleys, one group in the form of



The Lancashire-Cheshire industrial region.

an arc of which Manchester is the centre, and another group in the basin of the Ribble, chiefly on a tributary of that river. Macclesfield is a silk-weaving town. Cheshire and the south and west of Lancashire form

an industrial area of a different kind. The surface rocks of this area belong to the New Red Sandstone series which contains beds of salt that form the basis of chemical industries. St. Helens, Widnes, Runcorn, and Northwich are the chief centres of the chemical industry (alkali, soda, &c.), Warrington, Port Sunlight and Widnes of the soap-making industry, and Ellesmere Port and Manchester of the dye-stuffs industry. Crewe is well known as a L.N.W.R. engineering centre.

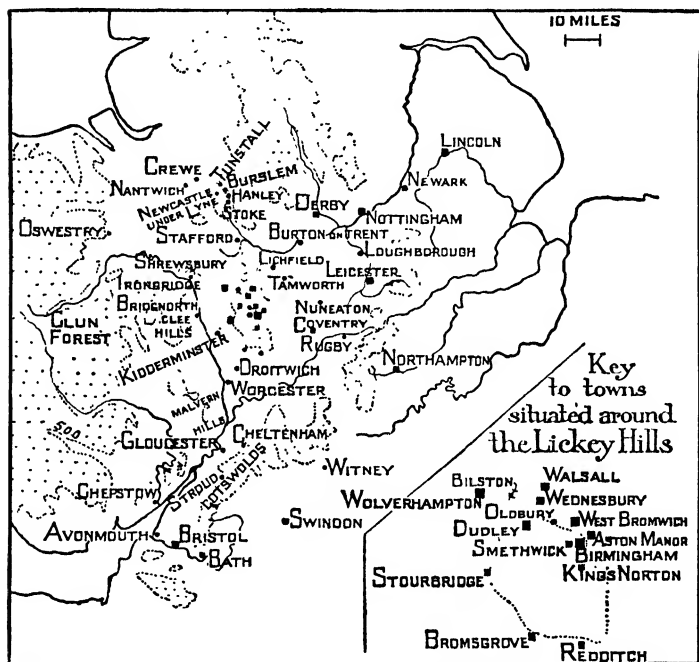
The estuary towns—Liverpool, Bootle, and Birkenhead—form the commercial head-quarters not for the adjoining area only but for a large part of the country; and in addition to shipbuilding they possess other industries, of which tobacco is an example, arising out of the special foreign trade.

Blackpool, Southport, and other smaller seaside resorts developed primarily as “health towns” for the workers of the interior; their prosperity depends largely upon the fortunes of the industrial areas.

THE MIDLAND INDUSTRIAL REGION

The coal measures, which have a wide extent below the New Red Sandstone rocks of the Midlands, actually reach the surface in the counties of Leicester, Warwick, Stafford, Shropshire, Denbigh, and Flint, whilst the York, Derby, and Notts coalfield stretches southward to the cities of Derby and Nottingham. This explains the wide distribution of industrial centres in the region. But attention is at once attracted to the group of towns around the Lickey Hills, where the South Staffs. coal measures are worked. The coalfield contains a valuable deposit of iron-ore which was

worked before either coke or coal came into use for smelting purposes. Some of the towns are not actually on the coalfield; Birmingham itself, the capital of the Black Country, producing all kinds of metal goods,



The Midland industrial region.

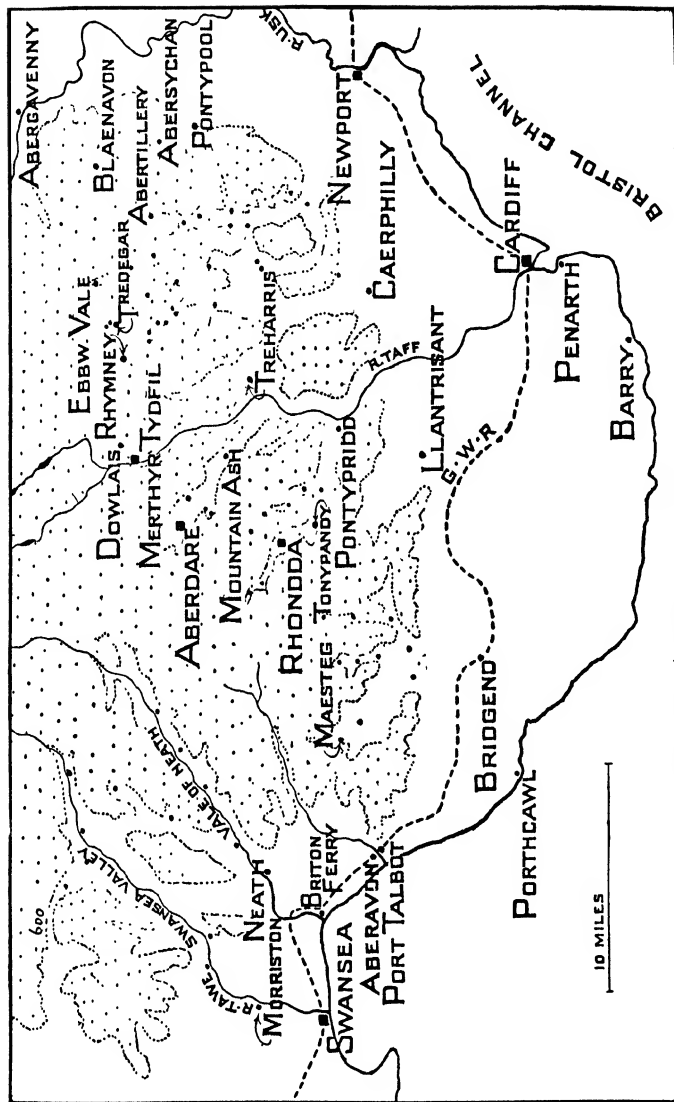
is a short distance from its eastern border. But all are engaged in some branch of iron-working. Stourbridge produces bricks for lining furnaces, made from local clays.

Metal-working and engineering centres are found

also in Coventry (cycles and motor cars), Loughborough (electrical machinery), Nottingham (machinery for its lace and hosiery industries), Derby, Crewe, Rugby, and Oswestry (locomotives and railway wagons), Shrewsbury and Lincoln (steam wagons and farm machinery), and even in Burton-upon-Trent, in spite of its great brewing interests. Another group of towns, forming practically one big centre, found on the North Staffs. coalfield, is engaged in making earthenware, tiles, &c., from local clays, and china-ware from clay imported from Devon and Cornwall. Northampton, Leicester, and Stafford are important boot-making centres, and Leicester has in addition a prosperous hosiery industry.

THE SOUTH WALES INDUSTRIAL REGION

The development of the South Wales coalfield has proceeded along valleys cut deeply into the plateau. Each valley is traversed by one or two railways, and human settlements are "lined out" in what is almost a continuous town. The chief centres of industrial activity are situated far up the valleys, near the northern edge of the coalfield, where ironstone was formerly worked on an extensive scale. Welsh ironstone is not very suitable for steel-making, and the development of this industry in the nineteenth century led to the import of Spanish ore, and the rise of steel works near the sea—at Swansea, Neath, and Llanelly; the older centres—Merthyr, Aberdare, Pontypool, and others—have been able to "carry on" by reason of good transport facilities with the ports. Swansea is also the chief centre in Britain for copper-smelting



The South Wales industrial region.

and the making of tin-plate, both of which were formerly dependent upon supplies of ore from the opposite side of the Bristol Channel.

In the report of the South Wales Regional Survey Committee, published in August 1921, it was suggested that Llantrisant, Bridgend, and other places remote from the mining areas, should be developed as "dormitory towns", to provide for miners a healthy environment at the end of their day's work. It was also suggested that Porthcawl should be developed as the chief "health town" for the region.

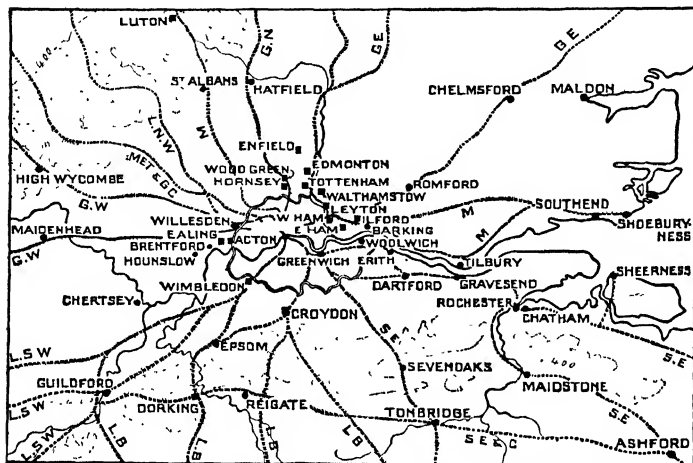
THE LONDON INDUSTRIAL REGION

There is perhaps as great variety in the occupations of the workers in the London district as in any of the other British industrial areas, though many of the advantages enjoyed by the latter are wanting in London. Only by remembering (1) that London is the greatest importing city, (2) that it has a population equal to that of a small nation, is it possible to give reasons for the establishment of industries in a region that possesses neither coal nor iron.

The second factor is the more important, for it means that there is in London a great market for goods of every kind. But even this has failed to make London a really great industrial region; many works have been transferred to more favourable situations during recent years, and the industries that remain, though numerous, are in general of minor importance. During the last half-century London has been becoming more and more a city of professional and commercial workers, that is, it has been

developing as the capital of an industrial and commercial country.

Amongst the more important industries carried on in the London district may be mentioned the making of furniture, soap, chemicals, dye-stuffs, and electrical



The London industrial region. (Dotted portion represents land over 400 ft. in altitude.)

apparatus on the north side of the Thames, and of engines, leather, baskets, and brushes on the south side.

At Erith and Dartford there are engineering works owned by Vickers Limited, who have works also in Barrow-in-Furness, Sheffield, and Birmingham.

Printing (books and newspapers) and the manufacture of scientific apparatus occupy a relatively large proportion of the industrial workers of London.

SMALLER INDUSTRIAL REGIONS

Other industrial regions, smaller in actual area than those mentioned above but by no means unimportant, are found in Belfast, the Cumberland coalfield, Barrow-in-Furness, and Bristol.

Belfast possesses some of the most famous shipbuilding yards in the world, and has in addition large factories for the manufacture of linen, tobacco, and ropes, though there are no sources of supply of either coal or iron, nor, with the exception of flax, of raw material, in the immediate neighbourhood of the city. The shipbuilding industry is fed with coal and iron from the Ayrshire coalfield. Londonderry and Armagh are associated with Belfast in the linen industry.

The Cumberland coalfield has three ports—Workington, Whitehaven, and Maryport—each of which is a centre for iron-smelting and export of coal. The fuel used for iron-smelting in this district is obtained from Durham, because Cumberland coal is not very suitable for the purpose.

Barrow-in-Furness, a fishing village 70 years ago, owes its development to the discovery of large deposits of hematite in Furness. At the present day, with great shipbuilding yards, blast furnaces, and factories for the manufacture of ordnance, armour-plate, railway wagons, jute and paper, it must be regarded as one of Britain's most important industrial towns; its population is 63,770.

Bristol. Coal measures which lie under the New Red Sandstone and Jurassic rocks of Somerset, appear at the surface in several places, and the largest of these exposures, named after Bristol, is the source of

supply of fuel for the industries of the city. Bristol, formerly the second British port, has still a large foreign trade, in addition to a very great coasting trade, and it has two outports in Avonmouth and Portishead. Some of the city's industries—the manufacture of tobacco, cocoa and chocolate, and sugar-refining—are associated with the old-established trade between Bristol and America and the West Indies. Other important industries are the manufacture of soap and chemicals, engineering, and boot-making.

EXERCISES

1. State the geographical advantages (and disadvantages), of each of the following industrial centres. Glasgow, Newcastle-on-Tyne, Leeds, Sheffield, Birmingham.
2. What factors have contributed to the importance of Liverpool, Manchester, and Hull?
3. Write a short essay on "Factors that govern the Distribution of Industries".

23. PRIMARY PRODUCTION IN BRITAIN

INDUSTRIES and commerce claim the attention of the majority of the workers of the United Kingdom, but agriculture and pastoral work are by no means neglected. British agricultural workers are indeed amongst the most successful in the world. Few other people obtain a better yield from the land, as is shown by the table below, where the countries are arranged in order of wheat yield. In the case of England, the yield was 3 bushels below the average of the last thirty years.

BEST YIELDS OF CEREALS IN 1919.

<i>Country.</i>	<i>Bushels per acre.</i>		
	<i>Wheat.</i>	<i>Oats.</i>	<i>Barley.</i>
Denmark	47·5	40·6	41·4
Scotland	38·5	38·2	35·2
Ireland	35·1	48·7	41·8
Belgium	30·1	40·2	46·2
England	28·7	35·6	29·0
Germany	24·9	34·4	27·0
New Zealand (1916)	23·2	30·2	24·9
Italy	16·0	25·2	16·7
France	15·7	20·3	16·8
Argentina	14·3	20·4	17·2
Australia (1916)	13·2	16·6	17·7
United States	12·5	26·5	21·7
Canada	10·1	23·0	20·5

The yield varies from year to year. In 1919 the crops in Canada, the United States, Argentina, France, and Britain were all seriously affected by drought, but the figures quoted are fairly representative. To prevent any misapprehension through the appearance of American countries at the bottom of the list, it may be stated at once that Canada and Argentina each produced two and a half times as much wheat, and the United States thirteen times as much as the United Kingdom. One point which cannot be missed is that the agricultural workers in these three famous wheat-growing countries could get a great deal more out of their land by giving it suitable treatment.

Notwithstanding the high yield in the British Isles, home-grown wheat will satisfy the requirements of only a quarter of the population; the rest have to live on supplies from overseas. In 1920 Britain imported for home consumption over 6 million tons of wheat and flour. The reason is, of course, that the British wheat-lands are very limited in extent. In England 1 acre in 20, in Wales 1 in 125, in Scot-

land 1 in 300, and in Ireland 1 in 500 is used for wheat ; roughly, 1 acre in 20 is given to oats in each country.

Wheat is grown on a large scale only in the eastern counties of England, including the East Riding, Lincoln, Norfolk, Suffolk, Essex, Cambridge, Huntingdon, and Hertford, which are the only English counties having 50 per cent. of their area devoted to crop-raising. During 1919-20 there was, however, a considerable extension of wheat-growing in the Midlands and in Wales, especially in the counties of Shropshire, Cheshire, Denbigh, and Pembroke.

The activities of British primary producers are governed by various factors, so that their energies are directed sometimes towards agriculture, sometimes towards pastoral work ; the history of primary production is therefore of considerable interest, and it explains the state of affairs prevailing at the present day.

In the years 1348-9 the Black Death reduced the working population by 50 per cent., and the remaining labourers took the opportunity to demand high wages. Land-owners generally met this by converting their land into grazing-farms, which required fewer hands. England became famous as a sheep-rearing country ; there was a great demand for English wool on the Continent, and a growing demand at home. Large numbers of country people migrated to the towns and were absorbed by the new industries. Another point worth noting is that the conditions in the fourteenth and fifteenth centuries led to the beginning of the modern method of tenant farming, as a means of meeting the labour difficulty.

Reaction came before the end of the sixteenth century, and during the seventeenth and eighteenth centuries agriculture became more and more important, having to provide food for a rapidly increasing population. Before the end of the seventeenth century attempts were made to reclaim waste land and to drain such areas as Malvern Chase and the Fens; the latter area received further attention in the eighteenth and nineteenth centuries and was finally made into a rich agricultural area.

But beyond discovering the value of the Rotation of Crops, British agriculturists made little progress until near the end of the eighteenth century. Then a Board of Agriculture was formed for the purpose of collecting information and finding ways of increasing production. The chief result was the introduction of improved machinery; the Board ceased to exist in 1822.

The founding of the Royal Agricultural Society in 1838 marks the beginning of the most progressive period in British agriculture—it marks the entry of the professional worker into the realm of primary production, and the beginning of scientific farming.

A series of experiments on plants and soils led to the use of artificial fertilizers, to the development of the manufacture of superphosphate, to the establishment of trade in nitrates with the South American republic Chile. At a later date another fertilizer was found in ammonium sulphate, which is obtained from a by-product in the manufacture of coal-gas. In this way the British agricultural region became one of the most productive in the world. Further, in 1889 the Board of Agriculture was established as a government

department, for the purpose of collecting and distributing information relating to agriculture, promoting education in agriculture, and preventing the spread of disease amongst animals. In 1903 the department assumed control of fisheries ; the official name is now the Ministry of Agriculture and Fisheries.

Market gardening, an occupation that is important in view of the demand for fresh fruit and vegetables in large towns, has attracted many people in recent years. Its success depends upon proximity to thickly-peopled areas, and market gardens are therefore most numerous in the counties near London—Middlesex, Kent, Surrey, Sussex, and Hampshire—in the West Riding, Lancashire, and Worcestershire.

In spite of the success of British agriculture, another reaction set in before the end of the nineteenth century, and a considerable amount of good corn-land was put under grass. There were several reasons for the change. Wheat was being grown in America and Canada on virgin land, and exported to Britain to be sold at a price which put the English farmer out of the market ; scientific farming is not cheap farming. In the second place, the industrial workers showed a desire for a larger proportion of flesh food. Many British farmers therefore gave up the attempt to compete with American wheat-growers, and turned to the more profitable task of supplying the demand of town-dwellers for meat—and milk. Pastoral work had the additional advantage of enabling them to provide hides and wool for manufactures.

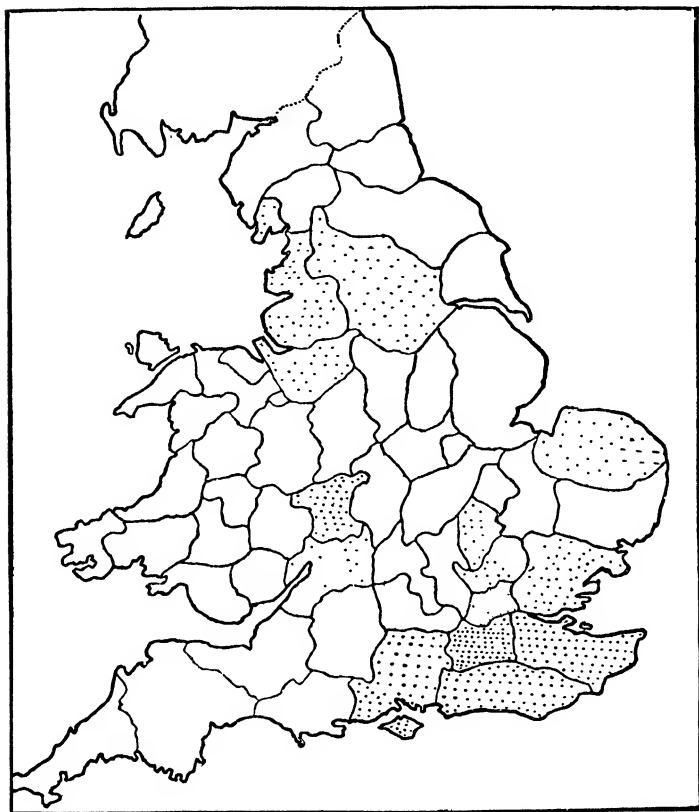
This goes a long way towards explaining the following interesting facts. The average number of cattle per square mile is greater in the United Kingdom

than in any other country in the world, and the average number of sheep per square mile is greater than that of any other country except New Zealand, even though British sheep were reduced in number by over 7 millions during the European War.

In this department of primary production, Wales and Scotland are essentially sheep-rearing countries, and Ireland, with a great dairy-farming industry, is a cattle-rearing land. In England as a whole cattle and sheep are more evenly balanced, but sheep are most numerous in upland regions and cattle on the plains of the Midlands and south-west; the chief cattle-rearing counties are Chester, Leicester, Shropshire, Stafford, Somerset, and Cornwall; the chief sheep-rearing counties are Kent, Rutland, Northumberland, Cumberland, Westmorland, and the East Riding.

The work of the primary producers of Great Britain, and especially of England, consists of what is called "mixed farming"—partly agricultural and partly pastoral work—which is the best way of using land to advantage, and the crops they raise include potatoes, turnips and swedes, mangolds and hay, in addition to cereals. There were also in 1920 about 3,000 acres planted with beet, and 22,000 acres in Great Britain planted with flax.

Industrial workers and primary producers are engaged in complementary occupations; their activities are, as it were, dove-tailed into each other, each group providing what the other must have in order to live and work. This is illustrated in a striking fashion in certain parts of Britain. Consider, for example, the West Riding area. Sheep are reared in



The chief market-gardening counties of England and Wales. (The number of dots is in proportion to the number of workers.)

large numbers by fell-land farmers, and the wool they yield is sent down to Bradford, Leeds, and other industrial centres. Cattle are reared by lowland farmers in the Pennine valleys and the Vale of York,

whence meat, milk, and hides are dispatched to the towns; market-gardeners send in daily supplies of vegetables; miners supply coal, iron-ore, and clay; all this may be described as "inward trade". The "outward trade" includes the supply of farm machinery, leather, boots and shoes, cloth, clothing, earthenware, and other goods manufactured in Leeds and the adjacent towns, as well as goods received from overseas for which the cities are distributing centres. Examples of the same kind may be drawn from every industrial area.

No one will suppose, however, that Britain is a "self-contained country"; the possession of good stocks of cattle and sheep does not mean that the primary producers are able to supply home demands for either meat or milk or butter, hides or wool. In fact British flocks and herds appear great only in comparison with the area of the country; but what really matters is the demand of the consumers. For example, the United Kingdom has about as many sheep as there are in New Zealand, but a population forty times as great; hence New Zealand is, in this respect, forty times as rich as the United Kingdom.

EXERCISES

1. Read *Outline of Industrial History*, chapter on "Food and Farming".

2. Write out lists of countries in which (a) large quantities of wheat are produced, (b) the wheat yield is high. Give a short explanation of the difference between the two lists.

3. On an outline map of the British Isles indicate in different colours the areas where the following branches of primary production predominate: wheat-growing, sheep-rearing, dairy-farming, market-gardening. Mark the position of the chief markets in each case.

4. Give an account of the changes in primary production in Britain during the last five centuries.

5. What is meant by a "self-contained" country? To which of the countries described in the preceding chapters is such a description applicable?

6. An attempt made in 1919-20 to grow cotton in Scotland was unsuccessful. To what causes would you attribute failure?

Name parts of the British Empire in which cotton is grown (*a*) on a large scale, (*b*) on a small scale, and regions in which its cultivation is being extended. (Refer to chaps. 7, 10, 12, 15, 17.)

24. BRITISH OVERSEAS TRADE

ANY one inquiring into the origin of trade would have to carry his thoughts back to the time when the human race appeared upon the earth, and the simple possessions of two men happened to be unlike. Perhaps a successful hunter would exchange a piece of meat or the skin of an animal for a supply of roots or berries collected by one whose inclination had led him in a different direction.

Such speculations, however, though not devoid of interest, have no connexion with modern trade; but it may be noted that, as in prehistoric times so in all ages, the great incentive to trade has been the possession, by individuals or communities, of dissimilar articles.

It was the demand for articles not produced in their own country that led Mediterranean peoples to open trade routes to India and the Far East some 6,000 years ago, that sent the Phoenicians coasting along three continents, and brought the Hansa

merchants over the Alps to Venice ; it is a similar demand that keeps the ocean highways thronged with vessels at the present day.

Primary production and manufacturing are occupations that yield goods as unlike as goods can be. Thus when a nation of primary producers and one of industrial workers are linked by an efficient transport service, the conditions for trade are most favourable. The primary producers have a surplus of food and raw material, and they require the articles made in factories and workshops.

As our survey of the continents has shown, primary producers form the majority of the population in countries of two types : (a) those settled by civilized people in recent times, and in which, since the population is comparatively small, there are large areas available for crop-raising and pastoral work ; (b) those which have been occupied by civilized people for thousands of years, but have been out of touch with the modern industrial world. In the former class come the British colonies, the South American republics generally, the divisions of Africa, the East Indies and Polynesia, and, with the exception of the north-east portion, the United States. In the latter group come China, India, and Egypt.

The British people, devoted mainly to industries, rely to a great extent upon the countries named in the preceding paragraphs for supplies of primary products, though large quantities of both foodstuffs and raw material are imported from certain European countries, as we noted in the chapters on Europe.

British exports consist largely of manufactured articles such as textiles, metal goods, chemicals,

machinery, leather goods, and clothing. These are sent chiefly to countries from which foodstuffs and raw materials are obtained. Primary products exported from Britain consist of coal and fish, and such "re-exports" as wool, cotton, skins, metals, and foodstuffs.

For details of British imports and exports reference should be made to the "Annual Statement of the Trade of the United Kingdom", or to the December issue of the "Accounts relating to Trade and Navigation of the United Kingdom". The statistics are given under two heads, (1) General Trade, which includes the whole volume of imports and exports, (2) Special Trade, which includes imports for consumption in the country receiving them, and exports of home produce or manufacture.

The relative value of the different classes of goods imported and exported is shown in the table below, where the figures are given to the nearest million (£), for the year before and the year after the European War.

	<i>Imports.</i>		<i>Special Exports.</i>	
	1913.	1919.	1913.	1919.
I. Food, Drink, and Tobacco	290	707	33	33
II. Raw Materials and articles mainly unmanufactured	282	646	70	121
III. Articles wholly or mainly manufactured	194	266	411	631

Class II includes textile fibres, metallic ores, timber, paper-making materials, oil seeds, oils and resins, and rubber. Class III includes chiefly cotton and woollen yarns, metal goods, machinery, manufactured oils, chemicals, paper, glass and earthenware, and silk goods.

256 THE WORLD AND ITS WORKERS

The activities of the peoples who trade with Britain have been described in the preceding chapters, so that we can now say along which ocean highways the chief commodities are sent to British ports. Though the articles carried over any one route are very varied in character, there is generally one, and sometimes more than one, of outstanding importance. The chief routes and their distinctive features are set forth below.

The North Atlantic—Canada, United States, West Indies.

Cotton, grain, timber, fruit, canned fish and meat, dairy produce, sugar, tobacco.

The South Atlantic—Argentina, Brazil, and New Zealand (via Cape Horn).

Chilled and frozen meat, wheat, coffee, cocoa, rubber.

Panama and Pacific—New Zealand, South Sea Islands, California and British Columbia.

Meat, wool, dairy produce, copra, fruit.

The Suez Canal and Far East—India, Ceylon, East Indies, China, Kenya Colony.

Tea, jute, sugar, spices, cotton, tin-ore.

The Cape of Good Hope—South Africa and Australia.

Wool, hides, wheat, meat, butter, fruit.

West Africa—

Palm oil, coco-nut oil, rubber, ivory.

The Mediterranean—Spain, Italy, the Levant, Egypt.

Fruit, wine, cotton, olive oil, chemicals.

The North and Baltic Seas—Scandinavia, Baltic republics, Denmark, the Netherlands.

Timber, wood pulp, flax, dairy produce, sugar, margarine, ores, chemicals.

Apart from transport, the conduct of overseas trade is naturally in the hands of those whom we have described as commercial workers. Their duties include not only the purchase of foodstuffs and raw materials, but also the equally important work of finding markets for British goods; the welfare of the country, as a whole, is largely dependent upon their achievements.

Some of the commercial workers are merchants—tea-merchants, cloth-merchants, &c.—who buy in one land to sell in another, and their transactions require a small army of agents both at home and abroad. Many British manufacturers send out their own representatives to foreign countries; such men must have a thorough knowledge of the goods produced by their firm, and be able to speak fluently the language of the people amongst whom they have to work.

In dealing with this subject it is almost incumbent upon us to look back a few centuries, to the time when English overseas trade was in its early stages; when it was possible for an enterprising man to load his ship with merchandise, go on a trading expedition to the Mediterranean and the East, or into the “Golden West”, sell his cargo, bring home foreign goods, and make a handsome profit on his venture.

Those were truly voyages of adventure, but great as is the debt England owes to individual enterprise, we cannot enlarge upon them here. We are more concerned with the great trading companies who stimulated English industries, developed foreign commerce, and devised a system of trading that is copied at the present day.

One of the most famous of these was the Company of Merchant Adventurers, formed probably in the

fourteenth century, finally dissolved at the beginning of the nineteenth, and known at one time as "The English nation beyond the sea". The Merchant Adventurers found markets for English cloth in north-west Europe, where they had head-quarters at different times in Bruges, Antwerp, Hamburg, and Bergen. The return trade to England included tapestries, fine linens, and wines.

In the seventeenth century English cloth was carried into Baltic lands by the Eastland Company, and into Russia by the Muscovy Company, and both companies developed a re-export trade in spices and other eastern goods which had been imported by the home country.

From the sixteenth to the nineteenth century the Levant Company carried on a flourishing trade with Turkey, Asia Minor, Syria, Sicily, and various Aegean islands. Before the end of the sixteenth century an English ambassador, whose salary was paid by the Levant Company, was appointed to reside in the Sultan's dominions; his chief duty was to protect the company's trade, and he had power to appoint consuls in eastern towns for the same purpose. The outward trade consisted of cloth, skins, and metals; the return trade included silk, cotton, mohair, currants, wines, and Turkey carpets.

Perhaps the most famous organization was the East India Company, which was mainly instrumental in establishing trade with the East, and in making India part of the empire. The activities of this company have been described in an earlier chapter.

The Hudson Bay Company, formed in 1670 to trade in furs with Canada and to make England independent

of Russian supplies, acquired a large amount of territory west of Hudson Bay. The company is still in existence, but its territory was ceded to the Canadian Government for the sum of £300,000.

The British South Africa Company was formed to develop the resources of a large area in Africa, now called Rhodesia in honour of Mr. Cecil Rhodes, the founder of the company. The company continued to administer Rhodesia until 1922.

The great work of the old companies was to establish trading relations with foreign lands, and to find at one and the same time markets for British goods, and sources of supply of foodstuffs and raw materials. But the day of such companies is past ; at the present day the development of overseas trade depends very largely upon the enterprise of individual firms of manufacturers and merchants and their representatives in other lands.

The Government neither engages in commerce nor imposes any restrictions other than such as arise from levying duties on certain commodities. But the Department of Overseas Trade (Development and Intelligence) was formed in 1917 for the specific purpose of encouraging commerce.

Officers of the Department are stationed in the chief towns of the Empire and of foreign lands, for the purpose of collecting information of commercial value and assisting British representatives. These officers are brought home at regular intervals in order that they may come into direct touch with manufacturers and traders, whilst the information they obtain is circulated amongst those whom it concerns by the head-quarters staff.

The enormous development of industries in Britain and other countries during recent times has introduced into the quest for raw materials an element of competition ; and this, combined with the institution of such means of communication as the submarine cable and wireless telegraphy, has made commercial operations much more complicated than they were in former times.

Old traders dealt mainly in what are now called "spot" goods, that is, those which were ready for delivery. The modern newspaper has daily reports of dealings in "futures", that is, the buying and selling of wheat and cotton which are not in existence—or at any rate not fully grown. The object of the manufacturer in such dealings is to ensure a supply of raw material several months ahead.

Moreover, the buying and selling of commodities takes place in a Corn Exchange, Cotton Exchange or Wool Exchange, far away from the producing lands. London, for example, is the chief wool market in the world, and buyers from Europe and America attend the sales in London to obtain supplies of fine Australian wool. Even when a cargo is actually on the ocean it may change owners several times before the end of the voyage. Thus the captain of an oil-tanker proceeding through the Mediterranean en route to London may receive cable instructions at Gibraltar to deliver his cargo in New York, and while crossing the Atlantic may be re-directed by wireless to Monte Video. The increase in price that occurs on each transaction will not be greater than that caused by delivering at the original destination and re-exporting the cargo.

It is generally more difficult to attract a buyer than to find a seller, and in the search for markets for manufactured goods competition is even keener than in the quest for raw materials. The merchant or manufacturer who neglects his market is speedily supplanted.

Various causes, such as wars, strikes, increased cost of production, or turning out goods less attractive in appearance than those of other manufacturers, may result in the loss of a market. In this connexion the following figures, from the official report on the trade of Australia in 1919, are eloquent enough.

PERCENTAGE OF IMPORTS INTO AUSTRALIA FROM THE PRINCIPAL COUNTRIES TRADING WITH THE COMMONWEALTH.

<i>Year.</i>	<i>United Kingdom. Per cent.</i>	<i>United States. Per cent.</i>	<i>Japan. Per cent.</i>	<i>Germany. Per cent.</i>
1913	63.2	11.8	—	11.4
1914-15	64.9	15.2	—	—
1915-16	62.1	19.0	—	—
1916-17	61.2	20.2	4.6	—
1917-18	48.2	26.6	9.3	—
1918-19	46.6	29.3	11.08	—

EXERCISES

1. Under what circumstances is there likely to be a great volume of trade between two countries? Name countries that "pair" with Britain in this respect.

2. Make out a list of manufactured articles imported by Britain.

3. Give a short account of the activities of commercial workers engaged in international trade. What qualifications should such workers possess?

4. Describe the steps taken by the government to assist British overseas trade.

5. Explain the terms "spot prices" and "futures". What risks must be taken by a dealer in futures?

6. Write notes on the effect upon overseas trade of the

introduction of the submarine cable and of wireless telegraphy.

7. Using the December issue of the "Accounts relating to Trade and Navigation of the United Kingdom", make out lists of (*a*) countries from which Britain imports food-stuffs and raw material, (*b*) countries to which Britain exports manufactured articles. Group the countries according to the nature of their trade, and in order of importance.

25. TRANSPORT. PART I (INTERNAL)

THE great commercial problem of the ages has been how to transport merchandise quickly and cheaply from producer to consumer; it is a problem that receives most careful consideration at the present day.

So far as land transport is concerned, man made little progress during some five or six thousand years. The ancient traders who lived in the region we now call the Middle East, constructed causeways across the deserts that separated their land from foreign markets, and along them led lines of asses, mules, and camels laden with their merchandise; and in the eighteenth century English traders were still travelling about the country with long lines of pack-horses, on roads and bridle-paths that compared unfavourably with the desert tracks of the Middle East.

Even at the present day primitive methods of conveying goods must be resorted to in such regions as the forests, deserts, and mountainous parts of Asia, Africa, and South America; but in the leading commercial countries, the progress of land transport during the last hundred years may fairly be described as phenomenal.

The history of sea transport is a record of almost continuous progress through a period of 5,000 years. The sea, a barrier to communication in former times, has long been regarded as the best of highways for international trade.

Modern transport may be said to have developed along three main lines. The first of these consists of improvements in the mechanism of transport. Progress is marked by the application of steam as a motive power on both land and sea ; by improvement in the design of vessels and the building of engines ; by the use of oil fuel and electric power ; and by the building of aeroplanes and airships.

The second line of development consists in the improvement of routes. Progress is registered by the making of roads with hard convex surface and in the reduction of heavy gradients ; in the dredging of river channels, the cutting of canals, the building of bridges in place of fords, and in the construction of railways.

The third line of development consists in the shortening of routes, exemplified in the tunnelling of the mountain systems of the world—the Rockies, Andes, Alps, and others—for the passage of railways ; in the building of trans-continental railways in North and South America, Asia, and Australia, and the projection of trans-continental railways in Africa. It is seen again in the cutting of the Erie, Rideau, and Welland canals, and the planning of the Trenton and Georgian Bay canals, in connexion with the Great Lakes navigation system of North America ; in the cutting of the Kiel canal between the North and Baltic Seas ; in the construction of the Suez

and Panama canals ; in the use of ferries for the transport of trains across the Baltic and, during the European War, across the English Channel.

But the grand opportunity to shorten routes comes of course with the development of navigation of the air, which is to a considerable extent independent of land configuration.

Referring now more particularly to Britain, it will be convenient to consider transport under two heads, viz. external transport, that is, the carriage of goods to and from other lands ; and internal transport, that is, the distribution of imports and home produce, and the collection of export goods.

The internal and external systems of transport converge upon the seaports, but the development of air-services will be accompanied by the institution of " air-ports " in the interior.

Internal Transport. The Romans are considered to have been the best road-makers of ancient times, and traces of the roads they made in Britain, for military purposes and the transport of goods, are still to be seen. With the withdrawal of the Romans road-making practically ceased ; the roads already in existence were neglected, and until the middle of the eighteenth century Britain was a land of bad roads.

But the period between the thirteenth and eighteenth centuries was one in which a good internal transport system was particularly necessary, for both home and foreign trade increased at a rapid rate. Traffic was therefore diverted to the rivers, and river-ports developed at the points of intersection of land and water routes. Amongst the chief of these, after

London and Bristol, were York on the Ouse, Boston on the Witham, Spalding on the Welland, Lynn on the Great Ouse, Nottingham and Burton on the Trent. In order to avoid road transport, traders often sent goods by circuitous routes ; for example, Cheshire cheese intended for the London market was carried to Burton-on-Trent by pack-horse, then to the Humber by river, and by sea to London.

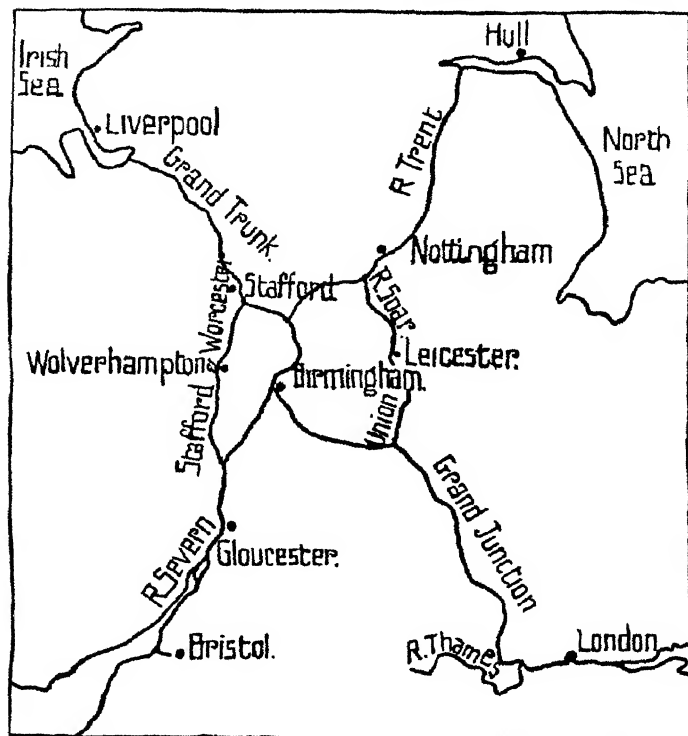
Most of the river-ports mentioned above had a large amount of foreign trade, much of which they lost during the nineteenth century. Lynn is described by an eighteenth-century writer as serving " six counties wholly and three in part ", and as receiving coals from Newcastle, timber from Scandinavia, wines from Lisbon, besides wheat and other grains brought down the river for export.

The advantages of water transport in the eighteenth century led to what has been called the " canal era ". This was opened by the cutting of canals in the neighbourhood of Liverpool and Manchester, chiefly for the purpose of carrying coal. One of the first was the famous Bridgewater canal, constructed by James Brindley ; the immediate effect was the halving of the price of coal in the cities.

The Duke of Bridgewater, and Josiah Wedgwood of pottery fame, were associated with an ambitious scheme to connect Liverpool, Hull, and Bristol by an inland waterways system, the chief part of which was known as the Grand Trunk ; this scheme also was carried out by Brindley.

Both the Black Country and the Pottery District derived great benefit from their connexion with sea-ports. In 1777 transport charges from Liverpool to

Birmingham were £5 per ton by road and £1 5s. by water; there were similar differences in the case of



The "Cross" system of canals, which, it is proposed, shall be reconstructed to permit the passage of a 100-ton barge. Estimated cost, £17,500,000.

all Midland towns near the canal. Industries were greatly stimulated; in eight years the number of pottery workers was more than doubled. In addition, the conditions of living were greatly improved, for

food and household goods were much reduced in price.

The Leeds and Liverpool canal, also opened before the end of the eighteenth century, aided the development of the textile industries and contributed to the growth of Leeds, Bradford, Keighley, Nelson, Blackburn, and Wigan along its route. Both this canal and the Grand Trunk brought a great deal of trade to Liverpool.

The success of these canals led to speculation in canal shares, and to the construction of other canals, some of which were absolute failures. Amongst the most important canals are the Grand Junction (Thames-Trent), the Thames and Severn, and the Kennet and Avon. In Scotland there are two cross-country canals—the Forth and Clyde and the Caledonian. In Ireland, Dublin is connected with the Shannon by the Royal and Grand canals, and there is a waterway from Carlingford Lough to the river Erne, via the Newry Canal, Lough Neagh, and the Ulster Canal.

More important than any of these, however, is the Manchester Ship Canal, constructed in the years 1887–94, by which the city of Manchester was made a port for ocean-going vessels.

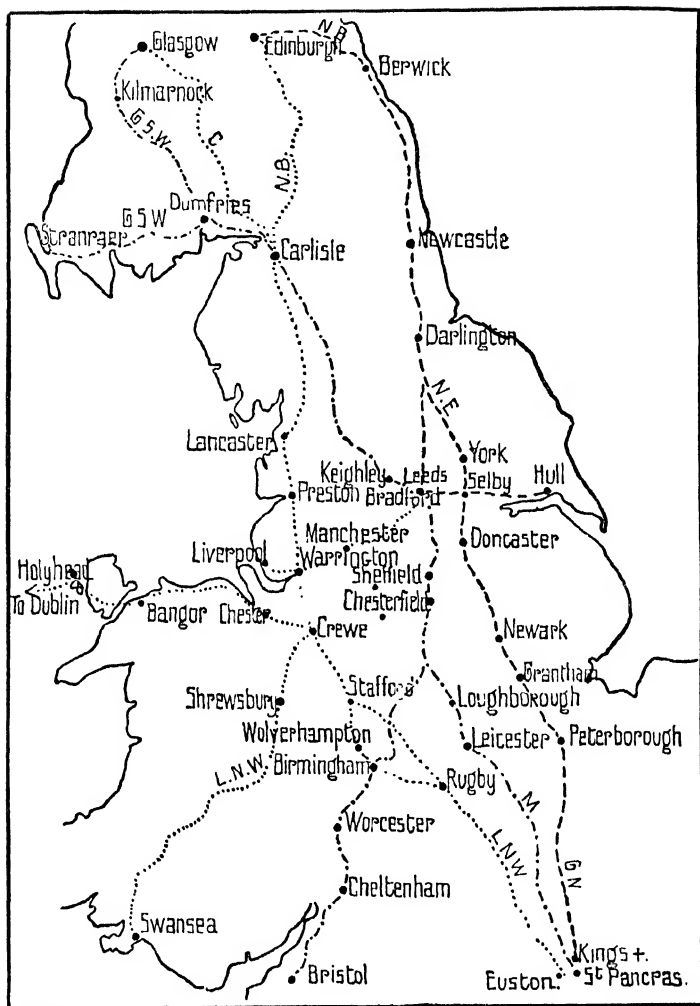
The best canals were not destined to have a very long period of prosperity. In the early years of the nineteenth century, Telford and MacAdam were at work improving—or rebuilding—the roads, and a certain amount of traffic was soon withdrawn from the canals. That was by no means serious; the blow to canal traffic came from railway companies.

Railways, first of wood and later of iron, had been

constructed in the seventeenth century for the transport of coal and mineral ores, but they were worked by horse power; they were even used by canal companies as cross-country connexions between two waterways. Possibilities in the direction of swift delivery of heavy cargoes suggested by the introduction of steam as railway motive power in the nineteenth century caused the canal companies much uneasiness. Aided by land-owners and town authorities, they fought a bitter fight against the railway companies, and fortunately for the nation, they fought in vain.

Without in the least depreciating the value of canals, which can still render invaluable aid to British industries, it may be said that the remarkable progress of the nation during the last seventy years has been mainly due to the railway transport system. This progress the railways fostered by making labour more mobile, that is, by facilitating the movement of workers to industrial areas; by enabling merchants and manufacturers to be in frequent and regular attendance at important markets in London, Liverpool, and other cities; by distributing milk, fruit, vegetables, and other perishable goods essential to the health of town-dwellers; and by providing for the swift delivery of newspapers and letters throughout the country.

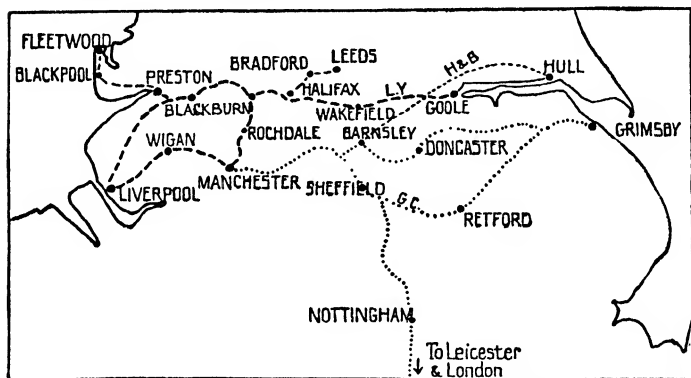
The great function of the internal transport system is to link the industrial and commercial centres with primary producers at home, and to complete the connexion with those beyond the seas. During the general strike in May 1926, it was proved that motor transport by road was an effective substitute



The railway routes to the North, showing the railways which by amalgamation formed the London and North Eastern, and the London, Midland, and Scottish Railways.

for railway transport in the distribution of food, for at any rate a short period. This success led to speculations as to the effect upon railways of further development of motor transport.

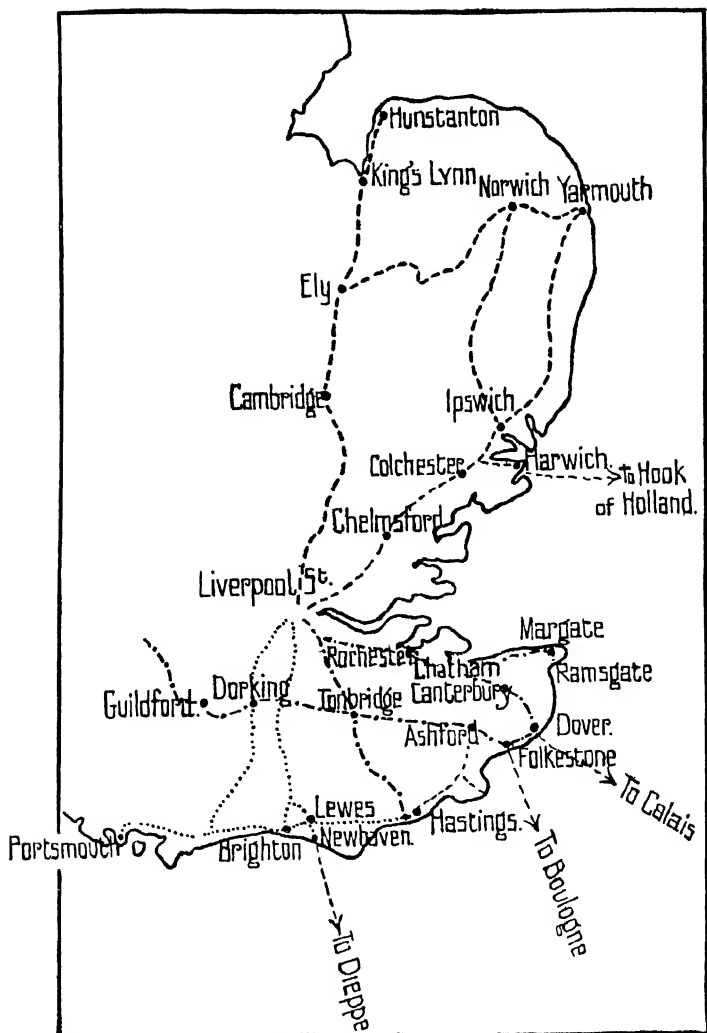
For the distribution of parcels, and small quantities of heavy goods within a restricted area, the advantage must lie with the motor lorry. But what would be the state of the roads, if the motor transport system



Cross-country lines in the North. The L.Y. and H. & B. have been absorbed by the L.M.S., and the G.C. by the L.N.E.

had to deal with anything like the 568 million tons of merchandise carried by the railways in 1913—in addition to 1,400 million passengers!

The railway systems as we know them to-day were formed by the amalgamation of groups of small railways, built originally for industrial purposes; the Great Northern absorbed 22, the Midland 35, and the Great Western 115 of such small railways. Further amalgamations took place in 1921, and there are now four great British Railways. These are the



The Eastern Counties section of the L.N.E.R., and the Central and Eastern sections of the Southern Railway.

London & North Eastern, London, Midland, & Scottish, Great Western, and Southern railways.

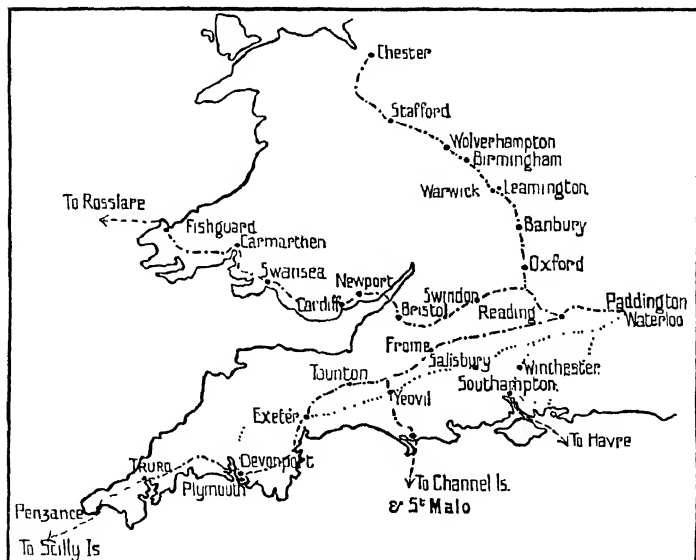
The direction of the main lines has been determined by several factors, chief of which are: (1) the distribution of industrial areas; (2) the situation of the commercial capital; (3) the situation of ports and packet-stations; (4) the configuration of the land—owing to the necessity of avoiding heavy gradients when possible.

The influence of the first three factors is indicated by the diagrams (pp. 269–73), from which may also be gathered a general idea of the nature of the goods traffic on the respective railways; the diagrams should be compared with a physical map. The influence of the fourth factor is well shown by following, on a physical map, the course of the railways in Wales, northern England, the Scottish Highlands, and the north and south of Ireland.

Lines owned by different companies meet at various points, and since all have the standard gauge, 4 ft. 8½ in., transport facilities are increased by the running of through trains over lines belonging to two or more companies. This adds greatly to the comfort of travellers, and saves both time and money in the transport of goods. Each company is charged in proportion to the number of trains and mileage run over “foreign” lines, and the work is carried out by the Railway Clearing House, to which each company sends particulars of its “traffic”. The work of this department has been greatly modified by the amalgamation of British railways into four groups, under the Railways Act of 1921.

For effective distribution of overseas produce, close co-operation between railways and ocean transport is

essential. This is accomplished by carrying railways along the piers of harbours, so that trains can be drawn up alongside vessels lying in the docks ; some railway companies are actual owners of docks. Both railway companies and port authorities make pro-



The main lines of the Great Western, and the Western section of the Southern Railway.

vision for speedy dispatch, and for the conveyance of perishable goods such as fish and fruit. It is no uncommon event for the cargo of a vessel docked in the evening to be distributed over the country during the following morning.

But both railway companies and port authorities store large quantities of merchandise, either at the

port or in some warehouse in the interior, issuing supplies as required by the merchant. Dutiable articles such as tobacco can be placed *in bond*, i. e. in bonded warehouses, and the duty paid when the goods are withdrawn for consumption.

Each of the four British Railways was formed by the amalgamation of previously existing companies, the chief of which are named below. This accounts for the fact that the railways have more than one London terminus or "head-quarters".

<i>Railway.</i>	<i>Chief Companies absorbed.</i>	<i>London terminus or other head-quarters</i>	<i>Situation of loco. and wagon works.</i>
London and North Eastern	G.C.	Marylebone	Gorton
	G.E.	Liverpool Street	Dukinfield
	G.N.	King's Cross	London
	N.E.	York	Doncaster
			Gateshead
			Darlington
			York
	N.B.	Edinburgh (Waverley)	Glasgow
London, Midland, and Scottish	L. & Y.	Manchester (Victoria)	Horwich
	L.N.W.	Euston	Newton Heath
	M. Caledonian	St. Pancras	Crewe
	G.S.W.	Glasgow (Buchanan St.)	Wolverton
		Glasgow (St. Enoch's)	Earlstown
			Derby
			Glasgow
			Kilmarnock
Great Western	G.W.	Paddington	Swindon
	Cambrian S. Wales Rys.	Oswestry	Oswestry
Southern	L.S.W.	Waterloo	Eastleigh
	L.B.S.C.	London Bridge	Brighton
	S.E. & C.	Victoria	Lancing
		Charing Cross	Ashford

EXERCISES

1. Read *A History of Inland Transport and Communication in England*.

2. Name countries where primitive methods of transport are largely employed ; give reasons, and mention the commodities.

3. Give an account of the ways in which trade routes have been shortened.

4. Describe the part of railways and of motor transport in internal distribution.

5. What are the advantages and disadvantages of transport by canal ?

26. TRANSPORT. PART II (EXTERNAL)

THE mere mention of British shipping makes one think of the *Olympic*, the *Mauretania*, the *Aquitania*, and other liners of over 30,000 tons, which steam at the rate of more than 20 knots. It must be remembered, however, that the British external transport system consists mainly of cargo liners and ocean "tramps", which are to be seen on every ocean and in every trading port in the world.

That ocean transport system, the greatest the world has ever known, is the growth of some three hundred years. At the end of the fourteenth century it was undoubtedly weak. The first Navigation Act, passed in 1381, prohibited the import of merchandise in any but British ships. The Act could not be enforced ; in the following year an amendment provided that English ships, *when able and sufficient*, should be preferred to all others.

It was not until the sixteenth century that there appeared any definite signs of the coming greatness

of English ocean transport service. Those were days of bold seamen, who, though equipped with nautical instruments of the rudest description, opened to Britain the great ocean routes; their exploits are worth recalling.

The Cabots had crossed the Atlantic and discovered Labrador and the great Newfoundland fishing grounds in 1497. In 1511 "divers tall ships of London" were sailing regularly to the Levant; between 1530 and 1532 William Hawkins sailed to West Africa and then to Brazil, and his son John started trade in slaves with the West Indies; in 1553 Richard Chancellor rounded North Cape, reached the port of Archangel, and travelled overland to Moscow to establish trading relations with Russia; in 1577 Francis Drake started on his voyage round the world, and brought back news of the East Indies that led to further trade; in 1594 James Lancaster sailed to the East Indies and opened trade with Java; in 1600 the East India Company came into existence, to continue with much tribulation the trade initiated by Lancaster.

This summary, though incomplete, is not a poor record for the sixteenth century, in spite of the fact that many of the "divers tall ships of London" were built in Baltic shipyards. The exploits recorded were steps on the way to a critical event in English commercial history—the struggle with Holland in the seventeenth century for mercantile supremacy. The issue of this struggle made Britain mistress of her own carrying trade and, incidentally as it were, mistress of the seas.

British shipping made great progress during the eighteenth century, which is distinguished by the building of great East Indiamen, by the use of

Harrison's chronometer to determine longitude, and by the famous voyages of Captain Cook.

The first half of the nineteenth century may be described as the "Age of clippers". These fine ships

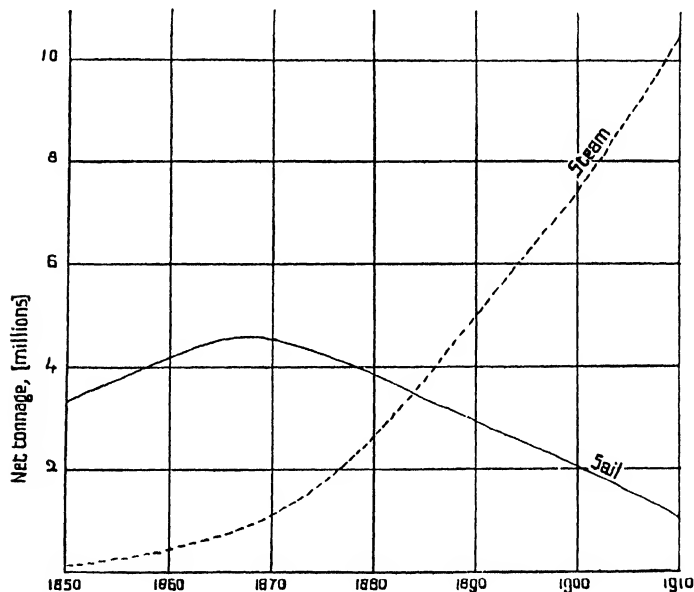


Diagram showing the rise of steam tonnage and the decline of sail tonnage of the United Kingdom at ten-year intervals.

were continually creating new records on their runs from Australia, America, and the Far East to England. One of the most famous was an American clipper, the *Lightning*, which in March 1854 sailed 436 miles in twenty-four hours—an average of over 18 miles per hour.

But the *Comet*, the first steamboat, was built on

the Clyde in 1812, and the first iron ship, the *Vulcan*, was built in 1817. These events indicate the coming of a new age. In 1838, the trans-Atlantic steamship service commenced with the sailing of the *Sirius* from London and the *Great Western* from Bristol. In 1840 the British and North American Royal Mail Steam Packet Company, the moving spirit of which was Samuel Cunard, began to carry mails from Liverpool to Halifax, Boston, and Quebec.

America entered the trans-Atlantic trade, and there ensued a "rates-war" and a speed contest, in which Germany was afterwards a powerful competitor, and which has been more or less continuous to quite recent years. Perhaps the most important results of the Atlantic rivalry are seen in the improvements in the design and construction of ships and engines. Progress in the development of the Atlantic liner is indicated in the list below.

<i>Vessel.</i>	<i>Built.</i>	<i>Length (ft.).</i>	<i>Gross Tonnage.</i>	<i>Horse- power.</i>	<i>Time to cross the Atlantic.</i>
Great Western	Bristol 1838	236	1,340	440	14 days
Baltic	New York 1850	282	3,000	800	9 d. 13 h.
Persia	Glasgow 1855	376	3,300	3,600	9 d. 12 h.
Oceanic	Belfast 1871	420	3,808	3,000	9 d. 10 $\frac{3}{4}$ h.
City of Berlin	Greenock 1875	488	5,490	4,799	7 d. 15 h.
City of Paris	Glasgow 1888	527	10,699	18,000	5 d. 20 h.
Teutonic	Belfast 1888	565	9,984	16,000	5 d. 16 h.
Kaiser Wilhelm II	Stettin 1901	678	19,361	45,000	5 d. 8 $\frac{1}{2}$ h.
Mauretania	Tyne 1907	762	31,938	70,000	4 d. 10 $\frac{3}{4}$ h.

The first two were built of wood, the third, fourth, and fifth of iron, and the rest of steel.

The achievement of the *Mauretania* practically brought to a close the speed competition, but many more large and luxurious liners have been built. Amongst the most famous are the *Vaterland*, *Imperator*, and *Deutschland*, built in German yards, but handed over to the Allies after the European War, and the *Olympic* and *Aquitania*, owned by the White Star and Cunard Companies respectively.

Though the most impressive examples of the ship-builder's art are found on the North Atlantic route, vessels engaged in trade with the East and with South America and Australasia are not inferior in design or construction, but generally speaking they are smaller; until a few years ago the limitations of the Suez Canal prevented large ships from entering the eastern trade.

Ocean-going craft may be classified as (1) mail and passenger liners, (2) cargo liners, (3) oil tankers, (4) cargo tramps, (5) sailing vessels. The course of a sailing ship naturally depends largely upon the direction of the prevailing winds, but vessels belonging to the first three classes traverse the ocean "lanes" with a regularity almost equal to that of railway trains. Ocean tramps go anywhere, and carry almost anything except oil; commonly enough they are in foreign waters for a year or more at a stretch, fetching and carrying for anybody, and returning to the home port only when they happen to pick up a cargo destined for Britain (see page 281).

There is in addition a large amount of tonnage engaged on the coastwise routes of Britain and the cross-channel service to the Continent. These vessels have developed from small undecked boats in 1780,

to twin-screw steamships of 2,000 tons steaming 16 knots at the present day, and competing with the railways for the transport of both goods and passengers ; except in the summer holiday season, however, passenger traffic on coasting vessels is very small. Often, too, a cargo liner, arriving in home waters with a mixed cargo for several ports, becomes for a period a coasting vessel to avoid the cost of reshipment.

Modern ocean routes have been considerably shortened by the coming of the steamship and by the opening of the Suez Canal (1869) and the Panama Canal (1914). Another noteworthy feature is the convergence of routes at certain places, e.g. the waters south-west of the British Isles, where more than a dozen transport routes, representing as many different trades, are drawn, as it were, to a focus ; the chief of these are shown on p. 283. No other portion of the ocean is so thronged with shipping, for nowhere else in the world is there such a group of commercial nations as Britain, France, Holland, Denmark, Germany, and Norway. Examination of a map of ocean routes will reveal many other foci of varying degrees of importance.

At the end of the year 1920 there were some 2,000 steamers fitted for liquid fuel. The remaining 24,000 which are included in Lloyd's Register are worked with coal, and the provision of coaling-stations at convenient places on the world's great routes is therefore a matter of highest importance. Steamships run from coaling-station to coaling-station ; and since the kind of coal used may turn the scale between profit and loss upon a voyage, a great deviation from the

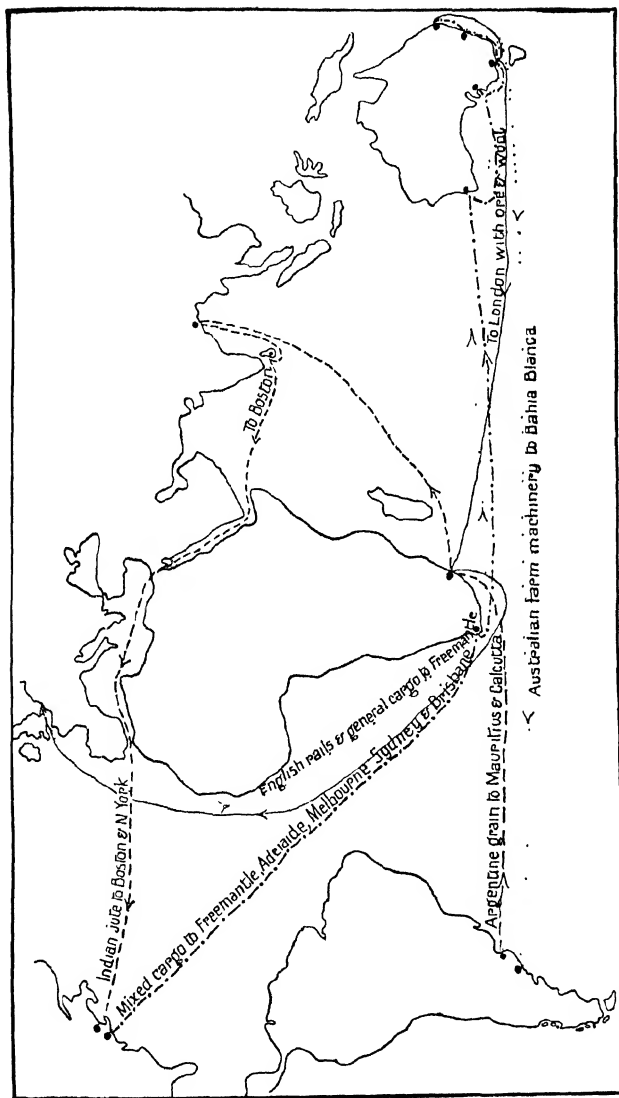
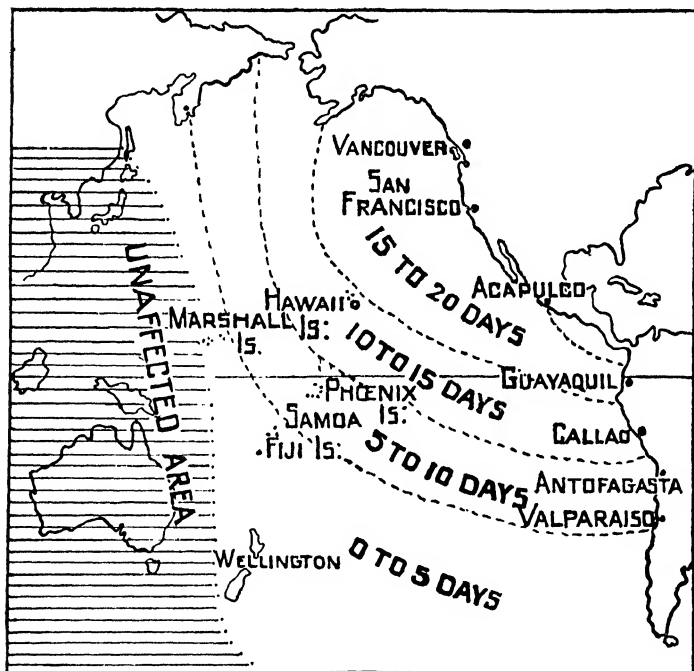


Diagram showing the track of a tramp steamer during a single voyage. Time of voyage, 1 year, 124 days; total length of voyage, 72,000 miles. Coaling stations used: Cardiff, Las Palmas, Cape Town, Durban, Albany, Sydney, Colombo, Port Said, Gibraltar.

direct course is sometimes made for the purpose of obtaining supplies of good fuel. Vessels proceeding



The Pacific Ocean divided into zones according to the saving in days effected by using the Panama Canal instead of the Cape Horn or Suez routes. (The number of vessels that passed through the canal during the four years ending 30th June 1920 was 8,767.)

to Australia via the Cape, for example, will sail up the east coast of Africa to Durban for coal.

The great coaling-stations on the route to the East are Port Said, Colombo, and Singapore, but there are

additional sources of fuel at Gibraltar, Malta, Aden, and Perim. At all of these Welsh steam coal can be

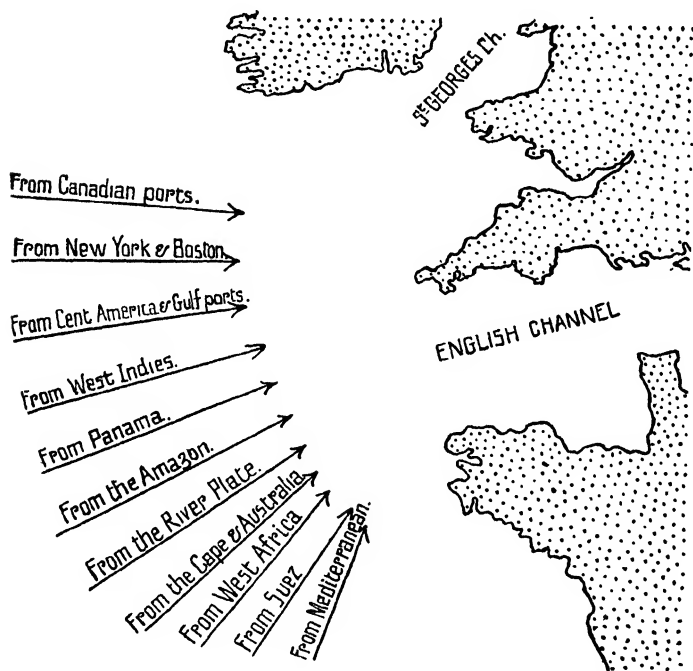


Diagram showing the convergence of Ocean routes in British seas.

obtained, but at Colombo British coal meets competition from the mines of India and South Africa, and at Singapore from India, Australia, and Japan.

Las Palmas in the Canary Islands is a coaling station for both the South American and the Cape routes; Monte Video is a station for the Cape

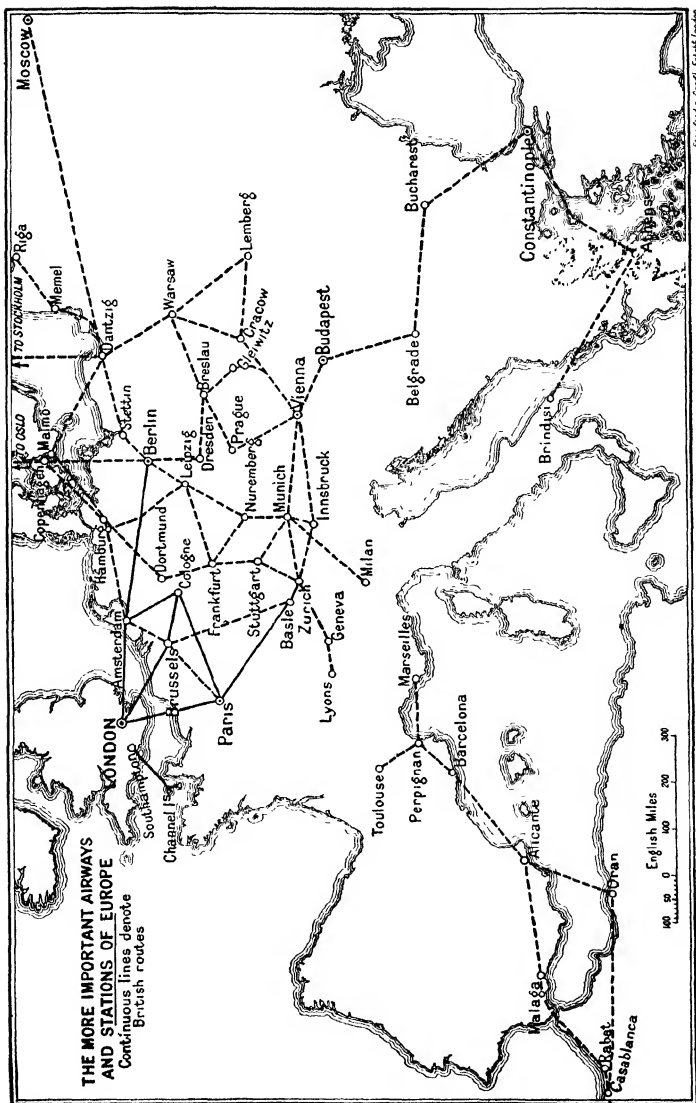
Horn route. Both of these are stocked with Welsh coal.

Though our attention is directed mainly to steamships, it should be noted that during the period 1915-20 there was a great revival, chiefly in America, of the building of wooden sailing ships, especially of big four- or five-masted schooners. Some of these vessels are engaged in trade with Europe, but most of them have been placed on the River Plate route. They carry coals from Norfolk in Virginia to Buenos Aires, and return with wool and hides.

A most interesting development in connexion with ocean transport is the equipment of vessels with refrigerating machinery and insulated chambers. This has made it possible to bring chilled beef from Argentina, frozen mutton and lamb, fruit, vegetables, eggs, and other perishable goods from Australia and New Zealand. The huge volume of this trade has necessitated the provision of cold storage accommodation at Southampton, London, and other ports, and also at the internal distribution centres of Britain.

The great demand for mineral oil during recent years has brought on to the ocean highways another special type of vessel, the oil-tanker, designed to carry oil in bulk. The barrels originally used for the export of oil were replaced by square tins packed in wooden cases, for the purpose of economizing space, and these are still widely used. In 1920, however, there were over 700 steamers and 82 sailing ships engaged in carrying petroleum in bulk.

Last in the long list of discoveries that have transformed ocean transport is that which enables ship-owners and merchants to communicate with vessels



in mid-ocean. Nearly all passenger-carrying ships in the world, and a great number of cargo vessels, are equipped with wireless telegraphy apparatus, and some possess wireless telephone receivers. During the last few years many have also been fitted with a Wireless Direction Finder, by means of which the ship's position may be determined in fog.

This reminds us of the importance to the commercial world of a system for the swift transport of messages to distant lands. The first message by submarine cable was sent from England to France in 1851. Fifteen years later the first workable Atlantic cable was laid by the *Great Eastern*, between Valentia and Newfoundland, and since then nearly 2,000 cables have been laid under the sea by different nations and companies. One particularly interesting feat, performed in 1902, was the laying of 7,800 miles of "All-British" cable between Vancouver and Australia, via Fanning Island, Fiji, and Norfolk Island. At the present time the Americans are engaged in making "All-American" cable connexions throughout the American continents.

Nothing is more wonderful than the progress in wireless telegraphy. In 1920 the British Government adopted a scheme for the establishment of an Imperial Wireless System—to link up the empire by stages of about 2,000 miles each, as shown on the preceding page. The first station, at Leafeld, Oxfordshire, was completed in August 1921. Almost immediately, however, it was announced that messages sent out from Leafeld were picked up at Perth (W. Australia), except when atmospheric conditions were very bad. It is intended to continue the construction of the

Wireless Chain, which will maintain communication with Australia when a direct service is impossible.

The development of aviation during the European War, 1914-18, has led to the establishment of Air Mail Services and Air Transport Services between London and such continental cities as Paris, Brussels, Amsterdam, and Rotterdam. The London-to-Paris air-express was started by the Handley-Page Transport Company in August 1919. Later on services were established between London, Rotterdam, Amsterdam, and Berlin by the Daimler Airway Company, between London and Cologne by the Instone Air Line, and between Southampton and the Channel Isles by the Supermarine Aviation Company. In 1923 all these firms agreed to work as one organization—Imperial Airways.

With the arrival of the last Napier D.H. express from Paris on 24th August 1925, British commercial aviation completed 6 years' work, during which 60,000 passengers were carried—and only 13 lives lost in airway accidents. The development of air-travel was accompanied by great reductions in fares. A single ticket from London to Paris is 6 guineas, from London to Amsterdam £4, and from London to Berlin £8.

An important French firm, Cie. Générale d'Entreprises Aéronautiques, works the airway connecting Toulouse with towns in French Africa, whilst the Paris-Constantinople route is operated by the Cie. Internationale de Navigation Aérienne. The Royal Dutch Air Service controls the route from Rotterdam to Copenhagen, and contemplates opening a route to the Dutch East Indies. Two German companies—Europa Union and the Deutscher Aero-Lloyd—

operate the long route between Berlin and Moscow ; the former firm has also joined a Swedish company in establishing air connexions between Dresden, Berlin, Malmo, Stockholm, and Oslo.

Airways beyond the limits of Europe which may be mentioned are : the 2,680 miles route between New York and San Francisco, traversed in 32 hours ; the "Desert Mail" between Cairo and Baghdad operated by the Royal Air Force ; and the Australian air lines between Geraldton and Derby in Western Australia, and from Cloncurry to Charleville in Queensland.

An agreement between the British Air Ministry and Imperial Airways drawn up in 1925 provided for an express aeroplane service once weekly in each direction between Egypt and India—Kantara to Karachi. This service has actually been in operation since January 1927, and as the "Desert Mail" is worked in conjunction with it, the Royal Air Force has been relieved of a duty which was discharged with remarkable success.

The Kantara-Karachi air-route passes through Gaza, Basra, and Bundar Abbas, at each of which there is a stop for the night. In the near future we may expect this route to be extended through Calcutta, Rangoon, and Singapore to Port Darwin, and then it should be possible to send an urgent letter from England to Australia in 100 hours—instead of 30 days.

EXERCISES

1. Read Basil Lubbock's *Round the Horn before the Mast* and the chapter on Transport in *Outline of Industrial History*.

2. Write short notes on the opening of trade routes by British navigators.

3. Give an account of the development of the Atlantic liner.

4. Explain the special value of the sailing ship and the tramp steamer in modern commerce.

5. What are the objects of the Imperial Wireless Telegraphic Scheme?

6. Trace on an outline map of the world the existing and projected air routes.

7. Use the "Accounts relating to Trade and Navigation" to find the amount of British tonnage entering and leaving ports of foreign countries during the year. Make a record on an outline map of the world, by drawing lines, varying in thickness, from Britain to each foreign country.

BOOKS FOR FURTHER STUDY

TITLE	AUTHOR	PUBLISHER
<i>Master Mariners.</i>	J. R. Spears.	Williams & Norgate (Home University Library).
<i>The Dawn of History.</i>	J. L. Myres.	" "
<i>Polar Exploration.</i>	W. S. Bruce.	" "
<i>Central and South America.</i>	W. R. Shepherd.	" "
<i>Canada.</i>	A. G. Bradley.	" "
<i>The Opening-up of Africa.</i>	H. H. Johnston.	" "
<i>People and Problems of India.</i>	T. W. Holderness.	" "
<i>The Story of Primitive Man.</i>	E. Clodd.	Hodder & Stoughton (Useful Knowledge Series).
<i>The Story of Geographical Discovery.</i>	J. Jacobs.	" "
<i>Captain Cook's Voyages.</i>		Oxford University Press.
<i>The World and its Discovery.</i>	H. B. Wetherill.	"
<i>In the Forests of Brazil</i> (from Bates's <i>A Naturalist on the Amazons</i>).		„ (Romance of Travel Series).
<i>A Trip up the Nile</i> (from Warburton's <i>The Crescent and the Cross</i>).		„ "
<i>The Land of the Lamas</i> (from Hue's <i>Travels in China and Tibet</i>).		„ "
<i>The Changeful Earth.</i>	G. A. J. Cole.	Macmillan.
<i>History of Commerce in Europe.</i>	H. de B. Gibbins.	„
<i>Outline of Industrial History.</i>	E. Cressy.	„
<i>Round the Horn before the Mast.</i>	B. Lubbock.	Murray.
<i>America of the Americans.</i>	H. C. Shelley.	Pitman.
<i>Japan of the Japanese.</i>	J. H. Longford.	„
<i>A History of Inland Transport and Communication in England.</i>	E. A. Pratt.	Kegan Paul & Co.
<i>Accounts relating to Trade and Navigation of the United Kingdom</i> (December issue).		H. M. Stationery Office.
<i>Continental Railway Guide.</i>		Thos. Cook & Son.
<i>The Statesman's Year Book.</i>		Macmillan.

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